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RESTRUCTURING THE FEDERAL SCIENTIFIC ESTABLISHMENT

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Restructuring the Federal Scientifi...

HEARING

BEFORE THE

COMMITTEE ON SCIENCE
U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED FOURTH CONGRESS

FIRST SESSION

JUNE 28, 1995

[No. 14]

Printed for the use of the Committee on Science

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**Vice Chairman

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RESTRUCTURING THE FEDERAL SCIENTIFIC ESTABLISHMENT

WEDNESDAY, JUNE 28, 1995

House of Representatives,
Committee on Science,
Washington, DC.

The committee met at 9:30 a.m. in Room 2318 of the Rayburn House Office Building, the Honorable Robert S. Walker (chairman of the committee) presiding.

The Chairman. The hearing will come to order.

Good morning. This is the first in a series of hearings to be held on restructuring the Federal scientific establishment.

We have a distinguished panel of witnesses, and I am looking forward to the testimony and questions from our members. The idea of bringing together some or all of the science programs of the Federal Government is certainly not a new one. This idea has surfaced quite often since the end of World War II.

Most of you know in just the last Congress I, along with the Ranking Minority Member, George Brown, introduced legislation to bring together some of the existing scientific elements within the Government to create a Cabinet-level Department of Science.

Some argue that this is just a recurring theme. However, I think it is more like a recurring realization of the importance science plays as a driver of economic growth.

In fact, a similar scenario played out before the establishment of the Department of Agriculture which involved the culmination of almost a century of successful and not-so-successful efforts to improve farming practices and coordinate agricultural activities in the United States.

In his last annual message to Congress in 1796 President George Washington recommended the creation of a Board of Agriculture after hearing of the success the British Government was having with the establishment of an English Board of Agriculture.

But not until 1862 was the Department of Agriculture established to address the concerns, present and future, of the over 50 percent of the population that lived and worked on the family farm.

The Department of Agriculture was needed in the 19th century to address the needs of our overwhelmingly agrarian economy. The Departments of Labor and Commerce were created in the early 20th century to respond to the rapidly developing manufacturing sector.

It is my contention that as we are about to enter the 21st century we should fully examine what our future needs will be and rationalize and structure the Government accordingly.

Our 21st century economy will be based on trade, science, communications, and knowledge. This, I think, is what the President's Commission on Industrial Competitiveness had in mind when one of its recommendations was to create a Cabinet-level Department of Science and Technology.

The report concluded, and I quote.

"Such a department should make clear the importance of science and technology at a time when technological innovation is the key to enhanced competitiveness. It would transform the current fragmented formulation of policies for science and technology into one that would be far more effective in meeting longterm national goals.

The elements and funding that would make up this department already exist within the Government. They should be integrated and focused more effectively. This department would also improve the effectiveness with which Government, industry, and academia interact in the process of building our nation's science and technology base.

Equally important, it would provide a high level advisor to the President on a variety of Government policies that affect science, technology, and the use of innovative products."

Today we have a distinguished panel of witnesses. First, we have The Honorable George A. Keyworth, former science advisor to President Reagan and Member of the President's Commission on Industrial Competitiveness, from which I just quoted; and Chairman of the Progress and Freedom Foundation.

The Honorable Don Ritter, former Representative of the 15th District of Pennsylvania and now Chairman of the National Environmental Policy Institute.

The Honorable Henson Moore, former Deputy Secretary of Energy and now President and CEO of The American Forest and Paper Product Association.

And finally today we have with us Dr. Joseph Spigai, Director of the Engineering Management Program at the University of Maryland.

Before proceeding with the hearing I would like to recognize Mr. Brown for any comments that he might like to make.

Mr. BROWN. Thank you very much, Mr. Chairman. With your permission I do have a brief opening statement which I would like to make.

Mr. Chairman, despite some of the differences in outlook you and I have on policy issue, we share a vigorous interest in the role science and technology plays in American society and in making the Federal Government a strong and capable partner in promoting progress.

Fifty years ago Dr. Vannevar Bush recommended to President Truman that the Federal Government overcome its arm's-length relationship with American science. Experience in the recent war, he said, demonstrated that science and technology had much to offer in advancing the quality of life for Americans and in improving American economic performance.

His report, Science, the Endless Frontier, has guided policy for science at the Federal level for 50 years, but the times he wrote are not our times. Many of the agencies forged in the crucible of the Cold War have found themselves suddenly bereft of an enemy upon which to focus their efforts. Where Dr. Bush saw an insidious Soviet Union threatening the United States, we today are seeking to work with the Russian Federation to build humanity's first great outpost in space.

If a new policy foundation is needed, only Congress can lay it as we step back for a moment to contemplate the broader scope of Federal support for the American scientific establishment.

I wish that the press of business had allowed us to hold this hearing earlier. I believe it would have helped all of us on the Committee to have the benefit of the perspective we will gain from our work here. When we finish this hearing, we will immediately go back to marking up this year's authorization bills.

Frankly, Mr. Chairman, I am concerned that at the same time we are discussing the rationale for restructuring the American scientific establishment, we are imposing severe reductions in the support for the elements of that establishment. By the time we have finished the agencies may not be able to carry out the strategy that we devise.

I do commend the Chairman for recognizing the importance of first discussing what is to be done before we build a structure to carry it out.

As Henry Lewis Sullivan said, form ever follows function. If we create a Department of Science, it should not be for refugees cast adrift as their parent departments are casually dismembered. Its formation should not be contingent on whether the Department of Commerce or Energy or Education is dragged down by the undertow of the budget resolution.

A Department of Science should be established because we on this committee have determined it is necessary. If it is necessary, Mr. Chairman, then the record of these hearings must be comprehensive enough to allow us to say why.

The most critical result from the work we begin here today will be the Department of Science's mission statement, and I appreciate the willingness you have expressed to work with us in selecting witnesses and framing issues to be considered in our subsequent hearings, and I ask unanimous consent to extend and revise my remarks.

[The prepared opening statement of Mr. Brown follows:]

OPENING STATEMENT

By the

HONORABLE GEORGE E. BROWN, JR.

Ranking Democratic Member
Committee on Science

Restructuring the Federal Scientific Establishment

June 28, 1995

Mr. Chairman, despite some of the differences in outlook you and I have on policy issues, we share a vigorous interest in the role science and technology play in American society, and in making the Federal Government a strong and capable partner in promoting progress.

Fifty years ago, Dr. Vannevar Bush recommended to President Truman that the Federal Government overcome its arms-length relationship with American science. Experience in the recent war, he said, demonstrated that science and technology had much to offer in advancing the quality of life for Americans and in improving American economic performance. His report, *Science, The Endless Frontier,* has guided policy for science at the Federal level for fifty years. But the times in which he wrote are not our times. Many of the agencies forged in the crucible of the Cold War have found themselves suddenly bereft of an enemy upon which to focus their efforts. Where Dr. Bush saw an insidious Soviet Union threatening the United States, we today are seeking to work with the Russian Federation to build humanity's first great outpost in space. If a new policy foundation is needed, only Congress can lay it.

As we step back for a moment to contemplate the broader scope of Federal support for the American scientific establishment, I wish that the press of business had allowed us the opportunity to hold this hearing earlier. I believe it would have helped all of us on the Committee to have the benefit of the perspective we will gain from our work here. When we finish this hearing, we will immediately go back to marking up this year's authorization bills. Frankly, Mr. Chairman, I am concerned that at the same time we are discussing the rationale for restructuring the American scientific establishment we are imposing severe reductions in the support for the elements of that establishment. By the time we have finished, the agencies may not be able to carry out the strategy we devise.

I commend the Chairman for recognizing the importance of first discussing what is to be done before we build a structure to carry it out; as Henry Louis Sullivan said, "Form ever follows function." If we create a Department of Science, it should not be as an orphanage for refugees cast adrift as their parent departments are casually dismembered. Its formation should not be contingent on whether the Department of Commerce or Energy or Education is dragged down by the undertow of the Budget Resolution. A Department of Science should be established because ***we***, the Committee, have determined it is necessary. If it is necessary, Mr. Chairman, then the record of these hearings must be comprehensive enough to allow us to say ***why***. The most critical result from the work we begin here today will be the Department of Science's mission statement, and I appreciate the willingness you have expressed to work with us in selecting witnesses and framing issues to be considered in our subsequent hearings.

We will face some fundamental questions about the departments we have created to carry out particular missions. This Committee has strongly advocated that the mission agencies of the Federal Government maintain research and development programs, and that those programs embody strong basic research components. While I might dispute some of the specific programs it has pursued, the Department of Defense is an excellent general example of the concept I have in mind. I do not think we should reduce these types of strong connections between agency missions and their research programs. Nor do I believe we should sacrifice basic research that arises from these mission-oriented programs. There are also the independent agencies to be considered; it may be more fruitful to bring these under the umbrella of a Department of Science. I think many of the organizational issues will resolve themselves when we are clearer about the goals we are pursuing.

The concept of a Department of Science has foundered in the past on concerns about the damage that might come from centralization of science. Science traditionally thrives in an environment with few constraints, and many who conduct science in America prefer the diversity that is a hallmark of our present system. No one disputes that some sort of coordinating mechanism is needed, but there will always be some tension between the centripetal tendencies of those accountable for efficient use of public funds and the centrifugal desires of those eager to push the frontiers of human knowledge to the limits. I have been here long enough to remember that we created the Office of Science and Technology Policy to manage this difficult dynamic, and Dr. Keyworth may be able to give us the benefit of his experience as Director of that office.

Mr. Chairman, in 1884 Congress for the first time considered restructuring the Federal scientific enterprise. It is a measure of the magnitude of our task that the Joint Commission established for that purpose had only to consider the U.S. Geological Survey, the Coast and Geodetic Survey, the Weather Service within the Army Signal Service, and the Hydrographic Office in the Navy. I trust the Committee's work will prove a substantial milestone in the Constitutional charge to "promote the general welfare." Thank you.

The CHAIRMAN. Without objection.

The Chair looks forward to the witnesses' testimony. We would appreciate it if you would summarize your remarks and keep them to five minutes, if possible. All of your testimony will be included as a part of the record.

Dr. Keyworth, we would invite you to begin.

STATEMENT OF THE HONORABLE GEORGE A. KEYWORTH, CHAIRMAN, THE PROGRESS AND FREEDOM FOUNDATION, WASHINGTON, DC

Dr. KEYWORTH. Thank you, Mr. Chairman, Members of the Committee.

Thank you, Mr. Chairman. It is a pleasure to once again appear before the Science Committee. I welcome this opportunity to share my perspectives with you on this important and this timely topic of the structure of the Federal Science Establishment.

I say timely because there is something very wrong with American science today. One symptom is a breakdown in the special trust of the American people that we enjoyed for two generations after World War II. It is eroding for four major reasons.

One, and the most alarming, is that we scientists are simply spoiled, the result of too much wealth acquired too easily, granted more with the accomplishments of our forbears in mind than our own.

The second is that American science has become a bureaucracy, and as with all bureaucracies, preserving the status quo has become the overarching goal replacing the pursuit of excellence, and our society does not respect bureaucracy.

A third reason for the erosion of public trust is that we have compromised the integrity of basic research, sacrificing it to the confusion of national competitiveness. As long as basic research described a quest for new knowledge and the education of new creative talent, our society viewed it as a legitimate and valued role for government.

Far less clear, I believe, is why government, which after all is but one customer among many, should bear the mantle of investing in technology to make America more competitive.

The final reason is somewhat more arcane, and that is that the conduct of scientific research has itself changed, yet the mechanisms of the Federal Science Establishment have not.

People, especially we scientists, view this differently. Some see it in the light of the big science versus little science debate of the '80s. Others view it as a return to more interdisciplinary research as the reaction to over-specialization.

I interpret it as the inevitable consequence of the explosive pace of digital electronics, computing, and information sciences.

But in any case government support for research has failed to stay abreast of that change, further contributing to the erosion of public confidence.

Simply put, American science no longer enjoys the level of public trust that sustained it for so long, and there is no solution other than to earn that trust back by refocusing on excellence and reemphasizing basic research and real accomplishments.

Now, claims by many of my colleagues that such public confidence is mere whimsy and not sustainable express, I believe, both ingratitude for two generations of unparalleled Federal largesse and a deeply ingrained lack of accountability.

It is we, the American science community, not the American people, who have failed to preserve the legacy of trust that Vannevar Bush launched.

One way to begin to rebuild that compact would be to abandon what one former chairman of this committee rightly described as the scientist's almost mystical faith in continued expansion and replacing it with a long-sought after priority setting that every other segment of government funding has come to expect.

But such program by program reform is unlikely to be successful unless accompanied by major structural change in the Federal Science Establishment, and that brings me to the central topic of this hearing.

No other comparably large area of government spending is spread so widely through government agencies, virtually defying any consistency with national policies. It is this diversity that, of course, is so appealing to we scientists who have mastered its intricacies in our quest for continued expansion, and we have somehow come to believe that the conduct of science is beyond the kind of public scrutiny that would likely befall a more focused Department of Science.

Well, perhaps it once was although I doubt it. What we had was the public's trust, not freedom from accountability, but we relinquished that trust, and it is time to become accountable again.

Let me turn to the specific questions before this hearing. To the first, whether a Department of Science will enhance our nation's technological competitiveness, I offer a qualified yes.

Our technological competitiveness depends upon much more than the Federal Science Establishment. The two ways that we know by which government can directly enhance technological competitiveness are through, one, improving basic research and thus the flow of new knowledge and new talent, as well as, two, a customer for new technology.

The pitfall is to perceive the Department of Science as a tool for promoting government industry partnerships to advance technology for which the government is not the primary customers.

We are latecomers to this Holy Grail, and judging by the results that other nations have experienced, that is a fortunate circumstance. Those less fortunate, particularly in Europe and Japan, who saw themselves in need of catching up in the explosion of particularly digital technology, began a series of government industry efforts in computing, in micro-electronics, biotechnology, and much more, with lofty labels like Eureka and the Fifth Generation Computer Project.

Simply put, they have failed, and I see no reason to expect that we would do otherwise, and the efforts we do have underway in the United States only strengthen my conclusion.

To the next question, whether a Department will bring a more rational approach to science policy, I must qualify my answer. U.S. science policy emphasizing basic research and new talent is both a good and rational policy. It is that Never, Never Land of technology policy that is ill-defined and increasingly irrational.

A Department of Science would, I am confident, make the debate over technology policy a more rational one with real implications more visible.

To the question of whether a Department will improve coordination among science programs, I respond with an unqualified yes. Today what formal coordination there is is largely conducted by the President's Science Advisor's Office, and yet that office is far better equipped to set science policy than it is to coordinate science activities.

In a Department of Science such coordination would be an overarching priority and a means to generate new efficiencies.

To whether there will remain a pluralism of science funding sources, I say, no doubt. What is under discussion preserves that pluralism, maintaining most of the interfaces that we scientists know so well.

What it does do, however, is to place them under a common, more accountable structure. As for the potential cost savings, they could be huge. The largest potential savings will, I suspect, come from the enhanced opportunity for priority setting and trade-offs.

I fear not for science nor for universities because they will benefit from the scrutiny, but many other programs, both those ill-conceived and those that have been unproductive, will not.

Turning to the issue of barriers between researchers and their end user agencies, I view this as an issue of continuing concern, but one that is not particular to the question of a Department of Science.

It began, in fact, with the infamous Manfield Amendment that separated the largest research customer, the Department of Defense, from the best research performers, universities, and I doubt the proposed Department of Science would do anything but improve the current situation.

In summary, I have considered the issue of a Department of Science for more than a decade, and I confess to having oscillated a few times in my conclusions, but the times make things much clearer now. The Federal Science Establishment is not working as well as it could nor as well as it did. The lack of public trust in it is testimony to that observation.

To restore that trust nothing less than a major overhaul is required. The overarching objectives, saving money and improving results, can only be accomplished if priority setting is enabled and if a new accountability is introduced.

The current system is virtually immune to those fixes. The kind of restructuring implicit in the kind of Department of Science under discussion here is the only way I know to restore coherent policies, research dedicated to excellence, and regain the public trust that was the legacy of our forebears in science.

Thank you.

The CHAIRMAN. Thank you very much, Dr. Keyworth.

[The prepared statement of Dr. Keyworth follows:]

Proposed Testimony of Dr. G. A. Keyworth, II
Chairman and Senior Fellow
The Progress and Freedom Foundation

To The Committee on Science
United States House of Representatives

Hearings on Restructuring of the Federal Scientific Establishment
June 28, 1995

Mr. Chairman and Members of the Committee:

It is a pleasure to once again appear before The Science Committee. I welcome this opportunity to share my perspectives with you on this important and timely topic of the structure of the Federal Science Establishment.

I say timely because there is something very wrong with American science today. One symptom is a breakdown in the special trust with the American people that we enjoyed for two generations after World War II. Post-war science policy was largely the product of the great visionary Vannevar Bush. It was he who declared that basic research would be the breeding ground for America's economic growth and progress. And, for a long time it was. American science set the standard for research excellence, worldwide. It produced a wealth of talent and new knowledge, and attracted even more from abroad. And that special trust with the American people was maintained. But recently, that trust has begun to erode.

It is eroding for four major reasons. One, and the most alarming, is that we scientists are simply spoiled--the result of too much wealth, acquired too easily, granted more with the accomplishments of our forebears in mind than our own. The second is that American science has become a bureaucracy. As with all bureaucracies, preserving the *status quo* has become the overarching goal, replacing the pursuit of excellence. And our society does not respect bureaucracy. A third reason for the erosion of public trust is that we have compromised the integrity of *basic research*, sacrificing it to the confusion of national competitiveness. As long as basic research described the quest for new knowledge and the education of new creative talent, our society viewed it as a legitimate and valued role for government. Public support for science stems from society's willingness to invest in its future. And our society has come to view government as the agent for that investment. Far less clear is why government which, after all, is but one customer among many, should bear the mantle of investing in technology to make America more competitive. Moreover, the marked contrast between Microsoft's contributions to technology and NASA's recent contributions, or those of the Departments of Commerce or Energy, can hardly prove reassuring. The final reason is somewhat more arcane. That is that the conduct of scientific research has itself changed, yet the mechanisms of the Federal Science Establishment have not. People, especially we scientists, view this differently. Some see it in the light of the big-science vs. little-science debate of the 1980's. Others view it as a return to more interdisciplinary research, as a reaction to over-specialization. I interpret it as the inevitable consequence of the explosive pace of digital electronics, computing, and information sciences. In any case, government support for research has failed to stay abreast of that change, further contributing to the erosion of public confidence.

Simply put, American science no longer enjoys the level of public trust that sustained it for so long. And there is no solution other than to earn that trust back by refocusing on excellence and re-emphasizing basic research and real accomplishments. Claims by many of my colleagues that such public confidence is mere whimsy, and not sustainable, express, I believe, both ingratitude for two generations of unparalleled Federal *largesse* and a deeply ingrained lack of accountability. It is we, the American science community, not the American people, who have failed to preserve the legacy of trust that Vannevar Bush launched. One way to begin to rebuild that compact would be to abandon what one former Chairman of this Committee rightly described as the scientist's "almost mystical faith in continued expansion," replacing it with the long sought-after priority setting that every other segment of government funding has come to expect. One example would be to place the health of universities above preserving employment in national laboratories, whose missions have largely become secondary to national needs. Another would be to relinquish programs designed to stimulate our already-healthy technological competitiveness for needed basic research in molecular biology, the pursuit of a Grand Unified Theory of natural forces, or complexity. But such program-by-program reform is unlikely to be successful unless accompanied by major structural change in the Federal Science Establishment. And that brings me to the central topic of this hearing. No other, comparably-large area of government spending is spread so widely throughout government agencies, virtually defying any consistency with national policies. It is this diversity that, of course, is so appealing to we scientists, who have mastered its intricacies in our quest for continued expansion. And we have somehow come to believe that the conduct of science is beyond the kind of public scrutiny that would likely befall a more focused Department of Science. Perhaps it once was, although I very much doubt it.

What we had was the public's trust, not freedom from accountability. But we relinquished that trust, and it is time to become accountable.

I have long advocated combining the key elements of the Federal Science Establishment into a Cabinet-level Department. It can be, if done responsibly, the best method to restore public accountability. The scientific community is likely to be about as helpful as the AARP has been in coping with the rising costs of Medicare. Industry could help, but its track record is little better. I do, however, have faith that the American system of government can make the kind of repair that is needed, especially when public pressure to do so is high. And I recognize that this hearing is being conducted in that spirit.

Let me turn to the the specific questions before this hearing. To the first, whether a Department of Science will enhance our nation's technological competitiveness, I offer a qualified yes. Our technological competitiveness depends upon more than the Federal Science Establishment. The two ways we know by which government can directly enhance technological competitiveness is through 1) improving basic research and, thus the flow of new knowledge and new talent, as well as 2) as a customer for new technology. The pitfall is to perceive the Department of Science as a tool for promoting government-industry partnerships to advance technology for which the government is not the primary customer. We are latecomers to this Holy Grail. And, judging by the results that other nations have experienced, that is a fortunate circumstance. Those less fortunate, particularly in Europe and Japan, who saw themselves in need of catching up in the explosion of, particularly, digital technology, began a series of government-industry efforts, in computing, microelectronics, biotechnology, and much more, with lofty labels like Eureka and The Fifth Generation Computer Project. Simply put, they have failed, and I see no reason to expect we would do otherwise. And the efforts we do have underway in the United States only strengthen that conclusion.

To the next question, whether such a department will bring a more rational approach to science policy, I must qualify my answer. U.S. science policy, emphasizing basic research and new talent, is both a good and rational policy, It is that never-never land of technology policy that is ill-defined and, increasingly, irrational, A Department of Science would, I am confident, make the debate over technology policy a more rational one, with the real implications more visible.

To the question of whether a department will improve coordination among science programs, I respond with an unqualified yes. Today, what formal coordination there is is largely conducted by the President's Science Advisor's office. Yet that office is far better equipped to set science policy than it is to coordinate science activities. In a Department of Science, such coordination would be an overarching priority and a means to generate new efficiences.

To whether there will remain a pluralism of science funding sources, I say no doubt. What is under discussion preserves that pluralism, maintaining most of the interfaces that we scientists know so well. What it does do, however, is place them under a common, more accountable structure. And I return to my earlier comments on the diversity of current science funding. The system works well for constituents who possess that "mystical faith in continued expansion." But the current morass of agencies and departments, Committees and Subcommittees, is hardly as accountable as it needs to be.

As for the potential cost savings, they could be huge. The largest potential savings will, I suspect, come from the enhanced opportunity for priority-setting and trade-offs. I fear not for science, nor for universities, because they will benefit from the scrutiny, but many other programs, both those ill-conceived and those that have been unproductive, will not. And here I must refer to a pet peeve. "Pork" in science is a new phenomenon. While never perfect, our scientific community generally preferred merit to regional politics. No longer. A Department of Science could stem that tide by simply making the cost of "pork" more obvious.

Turning to the issue of barriers between researchers and their end-user agencies, I view this as an issue of continuing concern, but not one that is particular to a Department of Science. It began with the infamous Mansfield Amendment that separated the largest research customer, the Department of Defense, from the best research performers, universities. I doubt the proposed Department of Science would do anything but improve the current situation.

In summary, I have considered the issue of a Department of Science for more than a decade, and I confess to having oscillated a few times in my conclusions. But the times are much clearer now. The Federal Science Establishment is not working as well as it could, nor as well as it did. The lack of public trust in it is testimony to that observation. To restore that trust, a major overhaul is required. The overarching objectives, saving money and

improving results, can only be accomplished if priority-setting is enabled and a new accountability introduced. The current system is virtually immune to those fixes. The kind of restructuring implicit in the kind of Department of Science under discussion here is the only way I know to restore coherent policies, research dedicated to excellence, and the public trust that was the legacy of my forebears in science.

The CHAIRMAN. Dr. Keyworth had indicated when we invited him that he was under some fairly severe time constraints this morning. What I would like to do is have members ask some questions of Dr. Keyworth until he has to leave in a few minutes and then go on to our other witnesses.

I hope that will be satisfactory to everyone. Mr. Schiff, did you wish to be recognized briefly?

[No response.]

The CHAIRMAN. Mr. Brown.

Mr. BROWN. Your last statement, Dr. Keyworth, resonated a little, as we say in our own thinking because I have oscillated back and forth on this issue, and there are several points of concern that causes this oscillation.

First, for example, the reaction of the science and technology community to a major change of this sort, and I will confess that in the community they generally resist change, no matter how good their scientific and engineering capabilities may be.

Secondly, there is a question of whether there are real benefits and efficiencies. Assuming you could overcome the turbulence of change and establish this, would there be real benefits and efficiencies?

And there is a third issue, basically political in nature. What is the appropriate political timing to do something of this sort?

On all three of these matters they seem to affect the situation differently. I would like for you to comment just briefly, if you could, on what has caused you to oscillate in your own thinking about this and whether you think there is an opportune time and circumstance at which something like this, if it could be proved demonstrably more efficient and effective, could take place.

You know we went through this after World War II when the endless frontier was put forth. We debated it in the Congress as to the best time and method to do this, and we came to no conclusion thereon, I think is the appropriate way to describe what happened in Congress at that particular time.

Dr. KEYWORTH. First of all, you and I have certainly discussed this and our own concerns over a long period of time so I welcome your question.

Let me recall when I worked so closely together with this committee in the early '80s to achieve the very large increases in basic research that were four to six times the rate of GNP growth, and I look back upon what we accomplished at that time, and I must confess that I think the level of our expectations, the level of improvement, the level of focus, enhanced excellent, better talent in the universities that drove us to that was simply not achieved, and instead what we saw is what I referred to as the growing bureaucracy.

So I think there is something wrong, and I think we are mistaken to deny it within the scientific community, although I certainly recognize that it will be difficult to get members of the scientific community in numbers to come up and testify in the same way that I am here.

Nevertheless, I hear within the community an increasing crescendo of awareness that something is fundamentally wrong inside the community. That refers to the "If it is not broken, don't fix it" argument. I contend that it is broken, and seriously broken.

The second question about real benefits, this is not a trivial question. The elements of the Federal Science Establishment are not totally redundant. They, in fact, are reasonably focused in terms of what they do in accomplishing their objectives.

To me the real benefits are to be achieved from that thing that we have struggled to do for so long, and we have so many hearings before this committee, which is priority setting, making those tough decisions. It will simply be enhanced when the tradeoffs are embedded in an institution.

In other words, if you cut something, it gives you money to put someplace else. So I think that is where the real benefits are.

As far as the political timing, needless to say I am not the most competent to judge on that; only that I certainly hear, living in the hinterland or the mountainous region of this country, that there is a thirst for change in this country that I have not experienced in my lifetime so I think if there ever is a time when you can erect this kind of change, it is now. Thank you.

Mr. BROWN. Thank you, Dr. Keyworth. Out of respect for your time, and not because I don't have additional questions, I waive further questioning at this time.

The CHAIRMAN. I thank the gentleman. Mr. Schiff?

Mr. SCHIFF. Thank you, Mr. Chairman. As a time saver I am not going to ask questions, either, but would like to use a minute or two just to make a brief statement.

First, I am going to have to leave the hearing in a little bit, and hope to get back. I serve as Vice Chairman of the Government Reform Committee, and Chairman Clinger has asked me to start a meeting on his behalf at 10:00 which I am going to have to do, but I just want to take a moment to say that the more I think about a Department of Science, the more I favor it, and there are two immediately recognizable down sides.

The first is potentially creating a new bureaucracy in an atmosphere and an environment where the Congress believes there are too many agencies and secretaries and assistant secretaries.

The second is perhaps causing strain and friction among the scientific and engineering and technology community stronger than it is today. In other words, presumably a Department would have a Department secretary, and there would be competition. Will that person be an engineer? Will that person be a high energy physicist, and so on and so forth? I have seen some of that in the military in terms of who is chief of staff of various military departments.

Nevertheless, I am becoming convinced it is a good idea for two reasons. The first is to consolidate the priorities, even with the friction that will result, of United States science which I think is now very, very scattered.

Second, I hope it will lead to a unified or at least more unified science budget.

Right now the budget for the various scientific research and development that we do is scattered among many different Appropriation subcommittees. I would like to see funding consolidated as much as possible in one Appropriation subcommittee so that there can be a close, day to day working relationship between an administrative agency, this committee, and the Appropriation subcommittee.

And one final word. I would put the National Institutes for Health, which are now under Ways and Means and Commerce, under this Department of Science and under the jurisdiction of this committee.

I think that health research is becoming so technologically motivated. If one has occasion to be ill, unfortunately, one, though, will find out that they have machines that do everything from taking temperature to on from there and, of course, remote diagnosis is becoming the solution to rural medicine.

So I just want to say I appreciate for those reasons your having this hearing, Mr. Chairman, and I yield back.

The CHAIRMAN. Thank you, Mr. Schiff. I would only say to the gentleman that we tried to get that kind of consolidation of health into this committee, and it proved to be a step too far, but we will continue to work for that.

Mr. SCHIFF. If the Chair will yield for just one second, I had a national news network—I won't say which one—invite me to be on a national program to talk about Federal health care funding priorities, and I said, "Well, if you pick me because of my subcommittee chairmanship on basic research, I want to tell you you have got the wrong chairmanship," and they argued with me about it. They said, "This is basic research," and so we went back and forth until they called back and said, "We found out you are right. You don't have health care."

I said, "Well, I am glad your network confirms my jurisdiction. I am glad to learn that." [Laughter.]

The CHAIRMAN. Thank you. Mr. Roemer?

Mr. ROEMER. Thank you, Mr. Chairman. I certainly respect the Chairman's tenacity and determination in bringing this up before the committee. Let me present a little bit of the skeptic's analysis here.

In a New Technology Week issue, article dated Monday, April 13, 1995, the name of the article is "Science Department? Ex-Science Advisors Say No," and the science advisors interviewed are Allen Bromley, former President Bush's science advisor, Edward David, former President Nixon's science advisor, Guyford Stever, former President Ford's science advisor—all say that we should not create a Department of Science.

I guess my question, Dr. Keyworth, would be what is the mission statement of your perceived Science Department? Will this save money; and will it fix what is wrong? We all have some solutions to right what is wrong. Certainly, we have heard Robert Galvin talk about decreasing bureaucracy and privatizing some of the laboratories in DOE rather than creating another department.

Dr. KEYWORTH. First, I guess, there is no question that those of us who have had the privilege to serve as science advisors to presidents probably follow the same oscillatory behavior that ex-chairmen of this committee and I have experienced. Two of those three gentlemen were on my advisory group. The other one is a close friend, and I can point to times when each of them were strong advocates for this.

It is a complicated question, and I am putting my position clearly which is if there ever was a time, now is the time.

What should it do? That is the crucial issue.

Mr. ROEMER. But they are not ambiguous now about it. They seem to be pretty firm about opposing it.

Dr. KEYWORTH. Then let me be unambiguous. I disagree.

Mr. ROEMER. You were pretty ambiguous in your statement. You said that you also went back and forth.

Dr. KEYWORTH. They have oscillated in the years that I have known them, went up and down, and they would say so quite clearly. I admit to this just as George Brown did because it is an extremely complicated question with risks that are inherent.

The thing that is different is that there are things today fundamentally wrong.

Let me answer your basic question which was what should it do because also, I think, that identifies some of the differences between myself and my predecessors.

In my opinion the Department of Science should do first and foremost two things, and it should not have an elaborate, complex, all-encompassing motherhood set of objectives. It should pursue the new knowledge and the production of new talent that cannot and will not be done in the private sector.

A good working definition of basic research, which traditionally means the development of new knowledge, but a good working issue is if you were to own stock in a company and they started to do this area of research, would you or would you not sell the stock? If it is basic research, you would probably sell the stock. In other words, it is very generic, hard to capture in industry research. That is one thing.

The second thing they should do is those things that government is supported by the American people, and those functions that are assigned by the American people such as the space program, for example, health research, defense; these clear areas where there is no ambiguity as to whether the American people do or do not support it.

Let me be very explicit. What I would say, and I think I said in my testimony, what I would be very, very wary of is using the Department of Science as a tool to enhance American competitiveness, and I relate, first of all, that I have not been able to find a single program of industry government partnerships, in this country or in Europe, that can be deemed an unqualified success, number one.

And number two, if we look at the area that the Commission on Industrial Competitiveness was most focusing on, most concerned 15 years ago, it was whether America would or would not survive the onslaught against our computer industry which was the fastest growing industry.

Here ten years later we took a look and we said, "I can't believe it." We absolutely beat off all comers. We gained enormous market share. We totally dominate the world in the computing industry by any reasonable standards.

We have been extraordinarily successful, and it was done and accomplished because there was basically no participation of government.

The CHAIRMAN. The gentleman's time has expired. Mr. Minge?

Mr. MINGE. I pass.

The CHAIRMAN. Dr. Keyworth, what priority do you place on basic research over applied research under a consolidated Federal research structure?

Dr. KEYWORTH. I would place basic research as high as any other national priority. First, by the way, I would argue that the country as a whole has supported that priority, on the average, for 50 years, but there are other government missions. Certainly, securing, maintaining our national security is, should I say, a natural function, first order function, of government.

So the extent to which technology that supports that clear role in government, I would place that very importantly.

What I want to be very clear on, Mr. Chairman, is that I think efforts to develop technology, because they are identified as critical areas of, if you wish, national ego, of global importance and popularity—I will quote one of the greatest businessmen in this country who said that the problem with a list of critical technologies that the government introduced in the late '80s, he said, you know, "Any high tech businessman who didn't know about that in 1970 would be out of business today."

It is very difficult to identify the growth sectors, and it is very difficult to identify why the government should be in optical electronics except as a customer. It is very difficult for me to understand why the government should be involved in the next generation of memory trips.

The CHAIRMAN. You note in your testimony that American society has lost trust in our scientific system. How would a more centralized approach help win that trust back, in your view?

Dr. KEYWORTH. Mr. Chairman, the word to me is accountability. I think this pervades so much of our concern today about our children. The word "spoiled" is not unique in my application to we scientists.

What we are suffering in a lot of our societal segments is a relaxation of accountability, and I think the clear accountability that, for example, needs to be maintained over the SSC, and wasn't, was not a fault of any particular person, certainly not this or any other committee. It was the fault of a general lack of an adequate accountability mechanism.

I think that is the important word behind this concept of a department. It is to make it accountable.

The scientific community and the Federal Science Establishment is, as I said in my testimony, basically immune to rigorous accountability today.

The CHAIRMAN. You made a point during your testimony of talking about this at a time when we have some dramatic change going on in society. It may be a good time to look at making some of these fundamental changes that we are talking about.

If the science structure we have today remains unchanged, what effect do you think that will have on our ability to maintain science as a priority?

Dr. KEYWORTH. I have to go back to my statement of maintaining public trust. One of the reasons why, if we look at the support for science since the years after World War II to now—and we see it stayed above GNP growth. It stayed much more constant than in most areas of government functioning—it is a statement of the trust that I speak of that we had.

That trust is clearly erroding. It is going to take a consolidated effort to earn it back again; a real effort, not a scattered effort of a few people here and a few people there. It is going to take a lot of hard work, a lot of pulling together, and a lot of scientific teamwork.

I certainly don't think that can be done now. As we experience the inevitable pressures on the budget that you all are dealing with daily, we will see the opposite of teamwork. We will see enormous competition between various segments of the community.

I just lightly referred to the big versus little science arguments of the '80s. This to me was a very unconstructive argument. It was not big versus little science. It was, in fact, material science versus other areas of science. It did not bring up the major issues of improving excellence and the way we support science in this country.

So what I am saying, I think it basically puts a spotlight on the debate, and a clear window on the debate, and that is what is constructive.

The CHAIRMAN. There has always been an international character to science, and it is going to become more so in the future. There are a lot of us who believe that most science programs in the future are going to be done in an international way.

Having served as a science advisor to the President, do you see any advantages in having anyone at the Cabinet level on science policies in terms of dealing with our international partners in international forums?

Dr. KEYWORTH. To the extent that other nations basically all have, without exception, have some form of what we are discussing here as a Department of Science. By the way, I wouldn't copy any one of them in this day and age.

But nevertheless, to the extent that they have them, I think it would be somewhat helpful. I do not think it is difficult for the United States of American to maintain an international position in science. It is a relatively straightforward and simple thing to do.

It is the coordination of all those activities, the internal part, that is difficult.

The CHAIRMAN. I am thinking more from the standpoint that in talking to some of the international folks who come through Washington, I get the impression that the international community has lost faith in our ability to be a reliable partner in all of this, and that is partly because we have a somewhat uncoordinated policy.

Would this, in fact, enhance our ability to be seen by the rest of the world as a more reliable partner in scientific work?

Dr. KEYWORTH. Yes, and I would like to just give you an unequivocal yes, but, you know, this is really a complicated thing because very often the leaders of our scientific agencies go immediately to Europe, before they even have a budget appropriated, and basically begin to make commitments and build foundations internationally in order to support their own programs.

This is where a lot of this "unreliable partner" comes from. But nevertheless, with these caveats and concerns, the answer is absolutely yes.

The CHAIRMAN. Thank you very much, Dr. Keyworth.

To those of you who have come in since we started questioning Dr. Keyworth, he is on a very tight time schedule.

What I would like to do is excuse him at this point and then go on to our other witnesses and let them each testify, and then to come back with questions for the panel.

With that, thank you very much, Dr. Keyworth.

Next, I would like to hear from Don Ritter. Welcome back to the committee.

STATEMENT OF THE HONORABLE DON RITTER, CHAIRMAN, NATIONAL ENVIRONMENTAL POLICY INSTITUTE, WASHINGTON, DC

Mr. RITTER. Thank you very much, Mr. Chairman, and good morning. I am Don Ritter. I chair the National Environmental Policy Institute and am a former member of this committee. I have had exposure to the Federal R&D economy as a customer while being on the faculty doing research and engineering consulting and research administration at Lehigh University before I came to Congress.

The Institute I chair is dedicated above all to the inclusion of sound science in making environmental policy, law, and regulation. That statement has impact on some of the things I am going to say.

I want to thank you, Mr. Chairman, and you, Mr. Brown, the ranking Member, for the opportunity to testify today. The issue is landmark in proportion as it discusses nothing less than future national science policy at a time of reinvention, at a time of change. As Dr. Keyworth said, if the time to do this was ever propitious, it is now.

If in this discussion of reinvention we are talking about cutting agencies out like Commerce, like Energy, I would hope that the case for creating a Department of Science stands on its own two feet and doesn't need dismemberment of other departments in order to succeed in what it is trying to do.

Before I turn to the questions laid out in the hearing charter, I would like to put some observations on the table. These would be observations on adding to the role of a new department and perhaps this committee.

This committee as the potential creator of a new integrated Federal science and technology entity must go beyond its traditional role for science and establish some rightful legacy as the protector of the quality and the integrity of science in the Federal legislative and regulatory process. So must the new entity. There is no higher level of responsibility and national need.

The opportunity is great. Science as a force for quality decisions in national regulatory policy has simply not lived up to its potential to enhance the performance of a $6 trillion economy.

One only needs to look at the recent intense debate over risk assessment and cost benefit analysis to feel the frustration that has built up over the years with poor quality, limited importance, and politicized science.

A new department with integration of similar scientific fields across the different missions can give a far higher profile to science and scientists and bring greater significance and influence of science to the national debate, both inside and outside of government.

If given new functions of oversight and quality control of science in legislation and regulation, this new department, responding to the needs of the committee, would mean more than just rearranged office space and shifted budgets.

The department could set high standards for peer review, transparency, and consensus science in the regulatory process. We haven't had that, and the Science Committee has been a kind of innocent bystander. Add to that the responsibility to inform government agencies' decisions and Congress's own decisions, and a new department really looks new.

A new department would orient its programs to delve far deeper into the science base for legislative direction and legislative action.

We talk about trade-offs in the hearing charter. Creating one organization from many by definition forms a larger single bureaucracy. The fairly small, independent agencies like NOAA will conceivably be swallowed up in comparison to DOE or even NSF, and so much of DOE's science effort is staked out in labs that are politically potent fiefdoms in and of themselves.

By and large with integration, yes, some plurality is lost, and some bureaucracy is gained. Insulation of the smaller agencies may result, and that may not be a bad thing, but plurality can also mean fragmentation and limited influence of science, and that is, I think, what you were referring to earlier, Mr. Chairman.

It is possible that a Science Department could also mean less politicization of science because of a stronger setting of priorities and greater separation between science and the regulatory process.

Now to the questions of the charter. The impact on competitiveness. I believe that a greater emphasis on science that could result from a strong, new department almost by definition would be good for our nation's scientific and technological competitiveness.

Indeed, science and engineering as productive professions have lost ground in proportion to their progressively lessening role in policymaking. A national focus of science could help to reverse this trend.

Also, given the revolution of our industrial economy where the real centers of excellence are widely distributed, where industry labs and universities are more and more making the directional decisions in science, a less past, mission oriented and more broad, future oriented approach by the Federal Government is in store.

Mapping the human genome and space exploration are examples of the kinds of things you wouldn't leave to the states.

Let me just finish up here. Just, you know, when industry seeks answers and scientists seek answers on solid state and technology of electronics, they don't go to Washington. They go to Intel and Silicon Valley for telecommunications. They go to Bell Labs in New Jersey or Hughes in California. All this means is that it is getting very much harder for Government to figure out what the best areas for research are.

Coordination, I think, is just a given by putting a department like this together. Integrating, as Dr. Keyworth says, really gives greater weight to science and increases the focus on science and recognizes the importance of science in legislation and regulation.

The role of scientist could change from that of simple advisor to actual participant. In a debate dominated by lawyers and policy practitioners, perhaps the scientist and the engineer should come up a little higher.

Now, there was a question about pluralization. I think the point of pluralization is this. With the Cold War era passed and with the best science and technology found not in Washington but all across the country, I think we need to think less of the Federal Government as the great locus of science funding opportunity. Pluralism is a question for the society at large, not so much for the Federal Government. That is where pluralism lies, out in society.

I mean, we have Internet as a possibility for research and development funding. Decentralization of effort and decisionmaking going closest to the problem of the opportunity seems to be the wave of the future. It is happening now, and I guess the point is this. Federal pluralism may even be an oxymoron. We shouldn't try to seek it so much.

Cost savings, I think, is a way to get a handle on the budget and to integrate different fields so that you don't have duplication. That is fairly obvious.

I will skip mission. Let me talk, just in conclusion, not all is well with the Federal R&D economy. First, it is way too big. Second, it is out of date. Third, it is not set up to inform and promote the quality and integrity of science as it should. Beyond this it has developed a momentum all its own where vast amounts of money have influenced generations of educators and universities.

This money has set the tone for nearly five decades, and much has been achieved, but changes in industry, global competition, and in the nature and practice of science and technology demand changes in the Federal R&D establishment.

Change is necessary on the part of those who become dependent on Federal funds. Dr. Keyworth talked about this a little. The entire Ph.D. training bureaucracy, for example, needs careful attention.

You can start by recognizing the problems of engineering and science teaching in our finest institutions. Right now we depend far too much on teaching our best students with teaching assistants who have real trouble speaking English and communicating with students. This after so many billions of dollars in research funding going to our finest universities. We have basically effectively changed the way we teach by defining the use of faculty resources as a function of money.

Oversight by this committee and follow-up by a Federal Science Department could make a difference, but, ladies and gentlemen, that is another hearing for another day.

I thank the committee once again for the opportunity to testify on this important matter.

[The prepared statement of Mr. Ritter follows:]

NEPI

National Environmental Policy Institute

Testimony

on behalf of

National Environmental Policy Institute

on

Restructuring the Federal Scientific Establishment

before the

Science Committee
United States House of Representatives
2318 Rayburn House Office Building
Washington, D.C.

June 28, 1995

by

The Honorable Don Ritter
Chairman
National Environmental Policy Institute

National Environmental Policy Institute
1101 16th Street, NW, Suite 502, Washington, D.C. 20036 • Tel: 202/857-4784 Fax: 202/833-5977

Good morning. I am Don Ritter, Chairman of the National Environmental Policy Institute and former member of this Committee. NEPI is dedicated above all to the inclusion of sound science in making environmental policy, law and regulation. I want to thank the Chairman, Mr. Walker, the Ranking Member, Mr. Brown and the Committee for the opportunity to testify today.

Ladies and Gentlemen, the history of creating an integrated national science and technology entity goes back almost fifty years. Only now, as we consider the reinvention of government at all levels, has the idea returned with enhanced credibility and potential.

The Chairman, Mr Walker, and the ranking member, Mr Brown, have a combined tenure of 52 years in Congress between them. They have been a dynamic duo, covering the political spectrum from one end to another, witnessing the vagaries of national science and technology organizations over that period. They were united in the 103rd Congress over HR 1300, an approach to the integration of federal science capabilities. Dissolving the Departments of Commerce and Energy in some ways makes a new Department of Science easier, but this should not be the driving force. Before I turn to the questions laid out in the hearing charter, I'd like to put some observations on the table, up front.

Observations on a New Role

This committee, as the potential creator of a new integrated federal science and technology entity, must go beyond its traditional role for science and establish its rightful legacy as the protector of the quality and integrity of science in the federal legislative and regulatory process. *So must the new entity.* There is no higher level of responsibility and national need. Science, as a force for quality decisions in national regulatory policy, has not lived up to its potential to enhance the performance of a $6 trillion economy. One only needs to look at the recent intense debate over risk assessment and cost-benefit analysis to feel the frustration that has built up over the years with poor quality, limited importance and politicized science. A new department, with integration of similar scientific fields across the different missions can give a higher profile to science and scientists and bring greater significance and influence of science to the national debate, both inside and outside of government.

If given new functions of oversight and quality control of science in legislation and regulation, this new department would mean more than just rearranged office space. The Department could set high standards for peer review and consensus science. Add to that, the responsibility to inform government agencies' decisions and Congress' own decisions and a new department really looks new. A new department would orient its programs to delve far deeper into the science base for legislative direction and regulatory action.

Tradeoffs

Creating one organization from many by definition forms a larger bureaucracy. The fairly small independent agencies like NOAA will conceivably be swallowed up in comparison to DoE or even NSF. And so much of DoE's science effort is staked out in labs that are politically potent fiefdoms. By and large, with integration, some plurality is lost and some bureaucracy is gained. Insulation of the smaller agencies may result. But plurality can also mean fragmentation and limited influence. It is possible that a Science Department could also mean less politicization of science because of stronger setting of priorities and greater separation between science and the regulatory process.

Now to the questions in the hearing charter:

Impact on Competitiveness?

A greater emphasis on science that could result from a strong new Department almost by definition would be good for our nation's scientific and technological competitiveness Indeed, Science and Engineering as productive professions have lost ground in proportion to its respectively lessening role in policy-making. National focus could help to reverse this trend.

Also, given the revolution of our industrial economy where the real centers of excellence are widely distributed, where industry, labs, and universities are more and more making the directional decisions, a less mission-oriented and more broad visionary approach by the federal government is in store. Industry's experience with quality and continuous improvement has led to a revolution in manufacturing and put them way ahead of government in knowing what's happening. For example, when industry seeks solid state science and technology they don't go to Washington, they go to Intel in Silicon Valley For telecommunication they go to AT&T or Hughes All this means it's getting harder for government to figure out what the best areas of research are.

A More Rational Approach to Science Policy?

I'm a believer in the reasonable separation of church and state. I also believe in keeping science and its evaluation reasonably apart from the regulatory process. So much of our collective grief has arisen out of that lack of separation. I wrote an op/ed with Sierra Club President Mike McCloskey [attached] that talks about separating scientific investigations and evaluations from the regulators at EPA. For the environment, you've all heard the arguments-- firewalls, creating a National Institute for the Environment, and reordering environmental functions from various departments (a kind of mini-Department of Science). Moving the science function out of EPA and into a Department of Science would be a step in the right direction and help begin the appropriate separation between scientific and regulatory functions.

Also, by integrating, giving greater weight to science, increasing the focus on science, and by recognizing the importance of science in legislation and regulation, the role of science and scientists changes from that of advisor to actual participant. In a debate dominated by lawyers and policy practitioners, perhaps the scientist should come up a little higher.

Coordination Among Science Programs?

This seems a logical result of a new Science Department. Right now, we seem to operate in science silos where the funding circumstance totally dominates who talks to whom. Coordination may be a good thing to work towards and is unlikely to happen under present conditions.

Pluralization of Funding?

I think the point is this: with the cold war era past, and with the best science and technology found all across the country, the time has come to think less of the federal government as the great locus of science funding opportunity. New vastly pluralistic funding opportunities are being found for those willing to innovate in industry and at state levels. In the future, pluralism will be induced via capital gains tax cuts and new research and development incentives which will connect more (not all for sure) of the scientific community directly with the market. Internet may even come to research and development funding. This is as it should be for a lot of research in this new era. Decentralization of effort and decision-making seems to be the wave of the future. Federal pluralism may even be an oxymoron.

I commented earlier on lost "pluralization" with a larger integrating federal science entity, but what about the greater ability to set national priorities. Priorities seem to be missing from so much we do in science-based federal policy-making. For example, many members of this committee now believe that the Superconducting Super Collider was a disaster. Look at what pluralism or politics did there. Could it have happened were there some better priority-setting capacity? It may be easier to set priorities with less power politics. Maybe a Department of Science is a case of national priorities versus interest group politics.

Cost Savings?

There will most likely to be cuts or a slowing of funds coming from Washington, D.C. That is a given. The question becomes, what kind of institution can handle this situation with greater ability to set priorities? A more powerful, integrated department with the ability to keep pace with new demands for new times or a fragmented set of big and small agencies forced to carry on the status quo while weakened by further budget cuts? Then, again, individual political constituencies fighting for more funds for their favorite agencies and programs will likely have a tougher time in a bigger department. Frankly, so will members of Congress. Maybe that's not so bad.

Will a New Department Separate Science from the Mission of Agencies?

Mission agencies like NASA, NOAA, and EPA are transferred whole in the discussion draft Mission agencies like DoT and DoD are not involved One tough call is DoE which has a long and tortuous history to begin with. They've suffered from being given (by Congress) some of the toughest jobs First, substituting their efforts and products for the market place and second, cleaning up the nuclear and other detritus of our cold war victory Yet some of the nations' most significant science resources are located in the labs They are a national treasure but are also groping for a mission. Perhaps a Department of Science could help define it. Henson Moore and Jay Keyworth have forgotten more about this subject than I ever knew, but between a new Department of Science and the existing Department of Defense structure, the transfers may be possible. One reservation: there is a lot of excellent work emerging in former nuclear weapons labs that is decidedly civilian That makes the transition a little more difficult.

EPA seems to be transferred in its entirety. I support the transfer of EPA science but the regulatory arm is another matter. That just doesn't fit with the idea of an integrated science department.

Conclusion

In conclusion, not all is well with the federal R & D economy. First, it's way too big; second it's out of date; third it's not set up to inform and promote the quality and integrity of science, and it should. Beyond this, it has developed a momentum all of its own where vast amounts of money have influenced generations of educators and universities This money has set the tone for nearly five decades and much has been achieved. But changes in industry, in global competition and in the nature and practice of science and technology demand changes in the federal R & D establishment Change is necessary on the part of those who've become dependent on federal funds The entire Ph.D training bureaucracy needs careful attention. We can start by recognizing the problems of engineering and science teaching in our finest institutions. Right now we depend far too much on teaching assistants who have trouble speaking English and communicating with students. This, after so many billions of dollars in research funding which have effectively changed the way we teach by defining the use of faculty resources. Oversight by a new federal science department could make a difference.

But ladies and gentlemen, that's another hearing for another day. I thank the Committee once again for the opportunity to testify on this important matter.

Seven Steps Toward Saving The Troubled Korean Deal

By Kay Bailey Hutchison

WHEN is a treaty not a treaty? When it's an "Agreed Framework."

When is a treaty violation not a violation? When it can't be verified because the Congress and the public don't know the provisions negotiated in secret.

Never before has there been a clearer case for public disclosure of an international accord than the administration's North Korean deal.

Last fall, the Clinton administration entered into this pact to freeze North Korea's nuclear program in exchange for United States heavy oil and the provision of a light-water reactor. Now the North Koreans are publicly threatening to restart their frozen nuclear program, and the deal the administration brokered in November is beginning to unravel. The warning signs were clear, but the president ignored them.

The administration, apparently fearing that Congress might alter or even nix the accord, thereby lost an opportunity to devel[illegible] bipartisan approach with the new R[illegible]can Congress in response to North Korea's destabilizing nuclear program and continuing military buildup.

Crucial months have passed since the accord was signed last October, and the Congress and the executive branch are still far apart on the administration's fundamental policy approach toward Pyongyang. The Senate remains skeptical about North Korea's intentions, and the North's recent actions have already demonstrated contempt for the terms of the framework. After receiving the first shipment of 50,000 tons of heavy oil from the US, North Korea immediately diverted some of that oil to support its heavy industry – a clear violation of the framework's stipulation that the oil be used only for heating and electricity production.

State Department officials made matters worse by, at first, keeping the information about North Korean violations secret and then providing conflicting testimony over whether the acknowledged diversion represented a violation of the "letter" or only the "spirit" of the accord. In fact, the diversion might never have become part of the public record if Gen. Gary Luck, who heads the United Nations Command in South Korea, had not forthrightly fielded my question regarding North Korean compliance in an open session of the Armed Services Committee a few weeks ago.

That the actual terms and conditions of th[illegible]mework – including the details re-g[illegible]g US oil deliveries as well as the specific requirements related to the provision of a light-water reactor to North Korea – remain secret, does not enhance the Senate's confidence in the accord. Now, North Korea is playing hardball over whether they will accept a reactor directly from South Korea, perhaps hoping to drive a wedge between the US and Seoul. In fact, the entire house of cards could collapse next month unless Pyongyang gives ground on this issue.

We should begin now to lay the groundwork for a US response if North Korea walks away from the accord. If that happens, US leadership will be necessary to manage a potentially dangerous international crisis. Negotiations notwithstanding, North Korea is shielding its military from the country's deteriorating economic situation and continuing to build up its conventional forces within striking range of 40,000 US troops across the demilitarized zone. The Agreed Framework, advertised as averting military confrontation on the Korean Peninsula, may itself become a factor in the escalation of the crisis.

Acknowledging the inherent flaws in the framework, the administration should take immediate steps to address the unstable situation on the North Korean Peninsula. The administration should:

■ Submit the framework for Senate ratification. If the framework holds after the next month or so, we are in it for the long haul, so the ratification process could lay the foundation for a policy that will endure beyond the current administration.

■ Publish all the terms and conditions associated with the framework, including details on oil deliveries. If North Korea knows what's in the framework, then so should the American people.

■ Freeze future US oil shipments until the State Department can develop and implement a credible plan for verifying that the oil is going where it is supposed to go. The next shipment – if there is one – should involve no more than 50,000 tons of heavy oil, in order to test the new verification system and gain confidence that North Korea can keep a promise.

■ Maintain and reinforce our military capability to deter the North Korean conventional threat. This is not the time to undermine our military readiness by canceling joint exercises with South Korea.

■ Rethink our policy regarding the presence of US dependents of military and diplomatic personnel in South Korea. We may want to start bringing them home (or stop sending them out there) now, while the framework is holding, rather than in the midst of a developing crisis when the State Department will argue that taking dependents out of harm's way will be seen as "provocative" by the North.

■ Prepare Congress and the American public for the very real prospect that, as early as next month, we may be back to square one if North Korea refuses the light-water reactor from South Korea.

■ Closely consult with Japan and China regarding our concerns and seek their support for swift action if the North Koreans violate the framework or further violate the nuclear nonproliferation agreement.

We have the military and economic means to contain and fully deter North Korea. Until Pyongyang provides concrete evidence of its desire to join the community of nations, we should continue to judge its conduct in light of our experience over the past 50 years – including its conduct since the accord was reached.

■ *Kay Bailey Hutchison (R) represents Texas in the US Senate.*

Sierra Club chairman and a former Republican congressman find middle ground in environmental debate

Assessing Science's Part In a Good 'Earth' Policy

By Michael McCloskey and Don Ritter

AS part of the Contract With America, House Republicans have passed legislation that would require the federal government to assess the risk of "major" environmental rules before they are applied. This bill, which has yet to pass in the Senate, is controversial. Why should risk assessment, ostensibly a science-based process, generate so much debate?

The main reason is that risk assessment is not a purely scientific exercise, because it blends science with policy choices. A recent study funded by the Department of Energy, "Choices in Risk Assessment," concluded that "risk assessments can be designed and biased to achieve predetermined regulatory outcomes and objectives." Politics will always play a role in environmental policy. But science should lay the groundwork for policy choices; it should not be distorted to justify political decisions.

To base risk assessments more on science than on politics, we need an objective source of quality environmental science.

Another problem is that most risk assessments are conducted with incomplete and inconclusive information. Policymakers must use partial data, create exposure scenarios, and rely on overly simplified models to determine risk. When it comes to ecological issues, such as threats to wetlands, the scientific data tends to be even more difficult to obtain and evaluate.

To base risk assessments more on science than on politics, we need an objective, reliable, accessible source of quality environmental science. We should shield this source from political influence. That's the challenge facing Congress, the executive branch, and the scientific community – and it goes a lot deeper than risk assessment.

The simplest solution might be to leave environmental research where it is, and try to establish a "firewall" to protect it from politics. That may be difficult to do inside regulatory and resource management agencies like the Environmental Protection Agency (EPA) and the United States Forest Service, where science is largely a response to past congressional directives. Science needs to be in the vanguard of environmental policy, not the rear guard.

Three former administrators of the EPA have backed a proposal to create a National Institute for the Environment (NIE), an independent, nonregulatory institute charged with improving the scientific basis for environmental decisions. The NIE would integrate scientific assessments of environmental issues with research, information services, and education and training, while staying clear of political and regulatory agendas. Rather than conducting risk assessments, a nonregulatory NIE would review risk-assessment methods, improve them, communicate them clearly to the public, and provide much-needed peer-reviewed data on which to base risk assessments. The result is not policy-free risk assessment, but far less room for those who would disguise policy as science.

Some have suggested combining all or parts of existing agencies like EPA, NASA, the National Institute for Environmental Health Sciences, and the National Oceanographic and Atmospheric Administration, to form a new environmental science agency. This would ostensibly bring cohesion and independence to environmental science while remaining budget-neutral.

Others are concerned that, under this approach, the credibility of the science would be undermined by inherited regulatory agendas and fragmented missions. Trimming budgets and reallocating the resources to a new independent institute with an exclusively scientific mission may ultimately be easier and more effective than reshuffling existing programs.

As we approach the 25th anniversary of Earth Day, America's environmental and political leaders stand at a crossroads. Few will argue with basing environmental policy on science. But, simply mandating more risk assessment will not solve our problems if it continues to be based on inadequate, politicized science.

Given the Republicans' legislative drive and the Clinton administration's effort to reinventing government, the nation's environmental science agenda might be the perfect prototype for bipartisan progress.

Congress and the administration have been telling us they can cooperate when they share common objectives. Here's a chance to prove it.

■ *Michael McCloskey is chairman of the Sierra Club. Don Ritter is chairman of the National Environmental Policy Institute and a former Republican congressman from Pennsylvania.*

The CHAIRMAN. Thank you, Don. We will now recognize Henson Moore. Henson, we welcome you back to a place where you have done some testifying before and also back to Capitol Hill. Thank you for coming today.

STATEMENT OF THE HONORABLE HENSON MOORE, PRESIDENT AND CEO, THE AMERICAN FOREST AND PAPER ASSOCIATION, WASHINGTON, DC

Mr. MOORE. Thank you, Mr. Chairman and Members of the Committee.

I think one reason the staff uncovered me as a potential witness is not because I am a scientist—I am not—or an expert at science administration—I am not—but because I have grappled in an administration as well as in the Congress with some of the very issues you are talking about.

So all I can really do is offer you some observations of what I saw from those years of grappling, mostly unsuccessfully, I might add.

First, I came to the conclusion at the end of my tenure in the Bush Administration that there really is a valid role for the Federal Government in basic research, and even in applied research if carefully done. There is a valid role.

Once you come to that conclusion, then a hearing like this becomes something that is viable and something that ought to be looked at as you need to begin to address the question if the Federal Government is going to play a role, how can we best organize that role.

I undertook that question within the Department of Energy. It has a very large, a very considerable research and development budget, both Defense and non-Defense. Most of the data responsibility of overseeing that budget and those activities fell to my lot, and I learned quite a lot.

One of the first things I tried to do after studying the question, as many of you have done, is to suggest a centralization within the Department of Energy of the research and development functions of the Federal Government and to rename that department the Department of Energy, Science, and Technology.

There was some considerable work done on that. There is a file somewhere at DOE with that work product in it. I quickly ran into all the buzzsaws you are going to run into and quickly found there wasn't much stomach for it, and the idea was, "Let's put that on a back burner. We have got other politically more important dragons to slay in the use of our capital," and that issue just wasn't a high priority and so it was put in the category of a second Bush Administration which was not to be, and so the issue never really got joined much more than an internal discussion and research, I guess, under my aegis within the Department.

But we did look at essentially what you are talking about and to convert essentially that Department, which has largely a research and development function today, or a science function today, into essentially a Department of Science as you are looking at.

During my consideration of the concept and the work I came across a number of conclusions. First, almost every major western democracy has a Department of Science and Technology and doesn't have a Department or a Ministry of Energy and so I thought that interesting and began to look into that as where they put their emphasis.

A second thing I observed is the fact that our government did not have then, and I don't think still has, a very clear national spokesperson for Federal policy on science and technology where other governments did—this Minister of Science.

I found it also difficult to attract world class scientists, Nobel Prize winners, into our Department to head up administrative positions in government as a political appointee. I think that the level of visibility of the job, the level of the responsibility, just wasn't good enough to be able to recruit the kind of people we would have loved to have seen come into government, and that is no aspersion on the people who came. We were lucky to get the people we got, but I think if we had had something with greater visibility and greater coordination and a greater role to play, we would have had a much easier time.

I also found we were not satisfied at all with the visibility or emphasis that we saw society spend on energy or look at science education or math education, and that became almost a signal thing the Department of Energy under Admiral Watkins personally began to work on is trying to put forth a greater emphasis on that, and I think there, again, it is because we didn't have any kind of a central role, a central leadership.

In working within the Bush Administration I found more often than not that there was insufficient coordination within the Administration on research or appropriations for research projects. There did not appear to be anywhere a central plan or vision for Federally supported research. I assume there may have been in the defense area, but that is not an area that we worked in other than what we did at DOE on behalf of DOD in nuclear weaponry.

Federal science projects seemed to either come from the Congress, which might have had a parochial interest or a vision or some idea or a good hearing, or it came from some bright idea that a particular department may have come up with, often totally independent of other departments or organizations, such as NIH and NSF. There was not a common, coordinated science agenda for as many reasons as there are players in the field.

I don't think anyone can conclude that the existing establishment is the most efficient or the most effective way to go about the Federal role in science.

My experiences also led me to think that this disorganization was not so much by agreement or by a carefully thought through idea that centralization or organization was the right way to go. I rather think that it came that way because of the fact that people view centralization, organization, coordination, whatever you want to call as the mission of a central figure in our government for science, they view that as a threat. They view that as a loss of something.

The Congress would look at it as a loss of control over these matters if there was really a central act going on in the Executive Branch of the government. It would also lose some of its ability to determine what that policy might well be from a parochial point of view.

In addition, departments or agencies viewed it as a loss of turf, a loss of appropriations, Federal job positions, some loss of status. Individual scientists or grant recipient institutions resisted it very often, or did resist it when I was there, for fear that they were going to lose something, too—research moneys that they were currently enjoying.

So organization or centralized Federal planning is essentially in my mind a good government initiative, the kind for which you will find there is very little support among the affected community.

I unsuccessfully tried to initiate, when I couldn't do it for everything across the Federal Government, within the Department of Energy. I tried to institute a prioritization of research projects just within the budget of the Department of Energy and learned very quickly that this threatened laboratories, research jobs, appropriations, projects themselves which in turn caused me to hear from Members of Congress on the particular subject. So I learned once again that trying to do it internally was almost as difficult as trying to do it across the entire Bush Administration.

We did propose to elevate what I consider a too low titled and responsible position in the Department of Energy for science from the Director of the Office of Energy Research into an Under Secretary for Science and Technology. I was successful in getting that to be a Bush initiative, but unfortunately it died in the Congress two Congresses ago, never became law.

This wouldn't have solved the problem, but it would have gone a little bit towards the direction of beginning to try to find a central figure and a central spokesperson for the Federal Government. As I said when I began, I think that science is absolutely critical to our future, and there is a viable, important Federal role to be played in that. With the limited resources we have, however, in government I think that one can't really believe that we can afford a lack of direction, we can afford duplication, or we can afford priorities being set for reasons other than what is really in the best interests of science and the nation.

My experience has caused me to conclude that those problems currently do exist, and they are probably not going to be solved under the organizational structure currently in place.

Therefore, it seems to me that this hearing you have undertaken is most appropriate, and I do believe from a policy and administrative point of view only, because that is all I am qualified to speak to, that a Department of Science would surely bring about a more focused vision of the Federal role in science, a more efficient expenditure of the people's money, a better opportunity to prioritize projects, more coordination of the Federal research projects going on, and a higher visibility and perception of the importance of science to the American people and abroad.

Most importantly, I really think it is in the best interests of science and our people.

Thank you.

[The prepared statement of Mr. Moore follows:]

TESTIMONY OF
W. HENSON MOORE
ON
"RESTRUCTURING THE FEDERAL SCIENTIFIC ESTABLISHMENT"
CREATING A DEPARTMENT OF SCIENCE
BEFORE THE
U. S. HOUSE COMMITTEE ON SCIENCE
WASHINGTON, D.C.
JUNE 28, 1995

Mr. Chairman and members of the Committee, I have been asked to testify before you this morning on restructuring the federal scientific establishment. I am glad to do so, but wish to point out that I am not a scientist, or an expert on science administration. I approach this subject strictly from the point of view of a former federal policymaker and executive. My experience as a Congressman and as Deputy Secretary of the Department of Energy are the basis of my observations and comments.

First, I have come to appreciate the importance of science to our economy, national defense, health, and quality of life. More often than not, a current problem facing us can be at least partially relieved by new technology. For these reasons, I have concluded that there is a valid and necessary role for the federal government to play in science, both basic and applied. Basic research requires government support or it will not get done due to the great difficulty in seeing far enough over the horizon to predict a commercial application. Applied research often needs government participation as a catalyst to precipitate further development or perfect a government utilization of the technology. Therefore, to eliminate all federal involvement is neither realistic nor desirable.

Once that conclusion is reached, how to organize our government to effect the greatest return to the tax dollar spent on science is a viable question. I spent some time studying that proposition while at DOE as I had daily responsibilities over the considerable science activities of that department. The result of that experience was my thought that the Department should change its name to the "Department of Energy, Science, and Technology". I believed then, and still do, that the name change was more indicative of its actual missions and what its future mission should encompass. That idea never became a Bush Administration proposal not because it lacked merit, but because there were simply bigger issues upon which to spend political capital.

During my consideration of this concept, I learned most western democracies had a ministry of science, but few had one for energy. I also observed that there really was not a clear executive branch spokesperson for science in our government as there is in others. We found it difficult to attract internationally known world class scientists to politically appointed science positions. We were not satisfied with the visibility or emphasis our society placed on science.

In addition, I often felt there was insufficient coordination within the Administration on research or appropriations for research. There did not appear to be a central plan or vision for federally supported science outside, I assume, the defense area. Federal science projects either seemed to be congressionally driven or a departmentally inspired idea each of which might be totally independent of the other as well as other departments and organizations such as NIH and NSF. There was not a common, coordinated science agenda, for as many reasons as there were players. I do not believe this establishment was as efficient or effective as possible.

My experiences led me to think that this disorganization was not so much by agreement that decentralization was consciously the best policy, but from a common view that organization meant the loss of something. Congress, which had it's sometime parochial view of what research projects were worthy and was operating in a vacuum as far as an over-arching federal policy was concerned, would lose some control. Departments or agencies would lose turf, appropriations and career job positions. Individual scientists or grant recipient institutions often resisted centralization for fear of a reduction in research monies they were currently enjoying. Organization or centralized federal planning is essentially a "good government" initiative for which there is typically little support from the affected community. Only science, perhaps, and the taxpayer would gain. Not many really speak for them.

I unsuccessfully tried to initiate a system for the prioritization of science projects within the considerable DOE science budget. I soon learned that prioritization threatened laboratories, research jobs, appropriations, and projects themselves which in turn caused concern in members representing those installations. I ran into most of the reasons which will be given in opposition to a broader effort at centralization. If one cannot do it internally, imagine the difficulty of trying to do it across multiple agencies.

In an effort to increase the effectiveness of the top science position at DOE and to enhance the chances of recruiting a top notch science leader/administrator, I suggested the upgrading of the current position of Director of the Office of Energy Research to an Under Secretary for Science and Technology. This did become a Bush Administration initiative which found itself in legislation in the Senate, but unfortunately did not become law. This would have helped the situation this hearing is investigating, but certainly would not have solved the problem.

As I stated at the outset, science is vital to our future and the federal government should be involved. It has limited resources, however, and cannot afford a lack of direction, duplication, or priorities being set for reasons other than the best interests of the nation. My experience causes me to believe those problems currently exist and probably will not be solved under the organizational structure now in place. Therefore, it seems to me the subject of this hearing is most appropriate. I do believe from a policy and administrative point of view that a Department of Science would bring about a more focused vision of the federal role in science, a more efficient expenditure of the people's money, a better opportunity to prioritize projects, more coordination of federal research, and a higher visibility and perception of the importance of science to our citizens and abroad. More importantly, I think it is in the best interests of science and our people.

I wish you luck in this good government endeavor as I believe you will find the opponents many and the supporters few. Most change is like that. I would be pleased to try to answer your questions.

The CHAIRMAN. Thank you, Henson, very much.

Dr. Spigai, we welcome you and look forward to your testimony.

STATEMENT OF DR. JOSEPH J. SPIGAI, DIRECTOR, ENGINEERING MANAGEMENT PROGRAM, THE UNIVERSITY OF MARYLAND, UNIVERSITY COLLEGE, COLLEGE PARK, MARYLAND

Dr. SPIGAI. Thank you, Mr. Chairman. Mr. Chairman, I want to thank you and the Members of the Committee for allowing me this opportunity to testify on the critical subject of restructuring the Federal scientific establishment and to comment on the draft bill to create a Department of Science.

At the outset let me say that my views are my own, based on my own personal research and experience, and don't necessarily represent those of the University of Maryland, University College or any other University of Maryland entity.

That said, Mr. Chairman, let me state that I wholeheartedly endorse the efforts of your Committee to consolidate the elements of the Federal scientific establishment to more efficiently use our funding resources and to provide a sharper focus for Federal R&D.

Toward that end I also fully support the creation of a U.S. Department of Science. The draft bill has many similarities to my own proposal for the creation of a Department of Science and Technology which I previously sent to you in a letter on March 8.

Although there are similarities between the draft bill and my own proposal, there are significant differences which I would like to discuss in my responses to the hearing charter questions.

I do believe that the key issue of both this committee's restructuring efforts and the draft bill itself is that the time has come to combine both science policy creation and funding authority to provide the resources to both government and non-government agencies to implement that policy.

In my view the current fragmentation of science policy agenda and research funding sources is something this nation can no longer afford.

Let me briefly address the questions posed in the hearing charter. First, will a Department of Science enhance our nation's scientific and technological competitiveness? The answer to that question is yes, providing that the Secretary of Science is given the necessary authority for both creating science and technology policy and the authority to provide the resources to implement that policy, as I noted earlier.

If the Secretary of Science speaks to business, industry, and the universities with one policy voice rather than a fragmented one, and has the resources to back them up, they will get the message as to what the nation's priorities are, and competitiveness, I believe, will be enhanced.

Opponents of a centralized department cite that science has benefited from a plurality of funding sources and a plurality of research agencies from which beneficial ideas may spring.

Dr. Jack Gibbons, the President's Science Advisor, has made that statement himself very recently. With respect, I would tell Dr. Gibbons that I may even agree with him, but his view of plurality is not broad enough. To me plurality means not only the Federal science establishment, which is admittedly a dominant force, but also should include the state and local agencies, research groups, the colleges and universities, business and industry and non-profit groups, science and technical societies and associations, and all of those foregoing entities in partnership and alliances with international agencies and research groups.

That is the plurality that I see, and it is large enough not to be endangered by consolidating Federal science agencies in order to sharpen our policy focus.

Daniel Greenberg, the editor and publisher of Science and Government Report, also said in an editorial in the Washington Post on May 10 opposing the creation of a Department of Science that fragmentation of Federal agencies is good for science. He cites the case where a researcher may go from one agency that turns him down to another agency to find funding for his ideas.

That may be true, but in reality agencies often try to overcome that fragmentation and try hard not to duplicate their efforts. In my own experience in the Office of Naval Research in the area of ocean science we worked very closely with our colleagues at the National Science Foundation to coordinate what areas and what researches we would each fund.

No, we were not one agency, but we tried hard to conserve our resources by not duplicating our efforts. As an example, as a general rule NSF funded all Antarctic research. ONR did not. ONR funded all Arctic research. NSF did not.

In short, I do believe we can better leverage our research dollar and enhance our competitiveness if we speak with one voice rather than many.

Second, will a Department of Science bring a more rational approach to science; and the third question, will a Department improve coordination among the science programs?

Taking these two questions together, the answer can readily be yes, Mr. Chairman, but I would add the following three cautions.

One, that the new department be organized logically at the outset by standard science and technology areas and not become a haphazard collection of agencies. Toward that end I would go so far as to recommend the inclusion of health and medical research entities such as NIH which was mentioned earlier, and also the Defense related basic and applied research organizations.

A base closure commission model would be the ideal mechanism for deciding which research agencies close, which consolidate, and which incorporate into the new department.

The second caution is that the infrastructure should be in place to provide the Secretary of Science with objective policy advice from the National Academy of Science to the National Academy of Engineering.

The third caution is that the new department should not mix regulatory functions with research policy and funding. In my opinion, having regulatory responsibilities would dilute the mission of the new department.

Let me pass on the fourth and fifth questions, and we can come back to that later.

Let me summarize with the sixth and last. Will a Department of Science separate science from the mission of those agencies that use that science?

Of course, if the agency is within the new department structure, the answer is no because the policy, funding, and implementation would be under one roof and thus aligned much closer.

As for agencies outside the department or outside the government, the relationship shouldn't change and ideally should be transparent to those non-departmental agencies.

Finally, Mr. Chairman, I believe that the Committee's efforts to consolidate science policy, funding, and implementing agencies is a worthwhile endeavor, and I hope they are successful. At the very least combining policy and funding is a very useful first step.

I also endorse the creation of a Department of Science although I would rather see it called the Department of Science and Technology, giving increased emphasis to the latter to enhance our link with industry so as to improve competitiveness.

I would also exclude the regulatory functions but eventually include into the department health and medical science and the defense related research.

I want to thank you, Mr. Chairman and Members of the Committee, for this opportunity to comment. I would ask that my previously submitted letter and proposal constitute my written statement and be included in the hearing record, and I would be happy to answer any questions.

Thank you, sir.

The CHAIRMAN. Thank you, Dr. Spigai, and I assure you that your written material will be included in the record, and I thank you for excellent testimony. This is subject matter you have given a lot of thought, and it was very worthwhile.

[The prepared statement of Dr. Spigai follows:]

UNIVERSITY OF MARYLAND UNIVERSITY COLLEGE
GRADUATE SCHOOL OF MANAGEMENT & TECHNOLOGY

March 8, 1995

The Honorable Robert S. Walker
U.S. House of Representatives
Washington, D.C. 20515

Dear Congressman Walker:

I noted with interest your proposal to create a Department of Science from the remnants of the Commerce and Energy departments and other agencies (Washington Times, March 3, 1995). I am writing to wholeheartedly endorse such a proposal. In fact, I have been working for some time on a similar, but more expansive, concept for a new U.S. Department of Science and Technology that incorporates the relevant science, technology and research elements of various departments and agencies into a more unified entity that can better respond to the future science and technology needs of the global marketplace. The essential elements of this proposal are outlined in the attachment 1 to this letter; a paper detailing the proposal will soon be published in the journal *Technology Management.*

My proposal, which makes a distinction between the regulatory and research functions of a department or agency, would also abolish the Energy department, placing its Science and Technology Programs into a new Department of Science and Technology, its Energy Programs into a new Department of Natural Resources, and its Weapons Laboratories and programs (those that remain) under Defense's DDR&E (which itself could become the new "Defense and Weapons Research" directorate of a new Department of Science and Technology). However, while my proposal also removes NOAA from the Commerce Department, it would not abolish the department altogether, but recast it as the Commerce, Industry and Economic Development department, incorporating, among other agencies, the Labor department and the Trade Representative from the President's office. As shown in Attachment 1, my proposal for a new Department of Science and Technology would also include NASA, NIST, EPA, NIH/NIMH, USGS, and other agencies, with the Secretariat and executive levels drawn from incorporating the OSTP/NSTC from the President's office and NSF. The department's advisory body would remain the NAS/NAE.

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301-985-7200

Congressman Robert S. Walker
March 8, 1995
Page 2

This proposal is part of a larger effort I have been engaged in to develop a more streamlined executive branch by the year 2000 by reducing the number of executive departments from 14 to nine, and drastically reducing, absorbing, privatizing or eliminating the 60+ independent agencies. I hope to complete this latter effort this summer and publish the results. A list of the new departments is given in note 11 of the proposal outline.

I respectfully request that you or your staff review the outline of my proposal in the attachment to see if there are any elements that merit your consideration for inclusion in the upcoming legislation. I would welcome any feedback you or your staff would care to provide, and would gladly volunteer some of my time to help research or craft this legislation.

Thank you for your consideration.

Sincerely,

Joseph J Spigai

Joseph J. Spigai,
Associate Director,
Technology and Engineering Systems

cc: Senator William Roth
Dr. John H. Gibbons, OSTP (Exec. Off. President)
Ms. Elaine Kamarck, (Office of the Vice President)

Attachment

A PROPOSAL FOR A NEW
U.S. DEPARTMENT OF SCIENCE AND TECHNOLOGY
March 1, 1995

Introduction

The new U.S. Department of Science and Technology would be formed over the next five years from among the various science, technology and research entities within the executive branch of government. Its mission would be to foster, conduct and sponsor basic and focused applied research in the sciences and engineering to gain knowledge and to use that knowledge to meet the needs of the people of the United States and in so doing, make the United States the technical leader of the world.

The Department of Science and Technology (DOST) would be formed mostly by the process of consolidating existing science, technology and research entities within the various departments and independent agencies of the executive branch of government. An attempt was made to eliminate duplicate efforts while preserving the ongoing efforts in those science and technology areas relevant to the needs of the people. In addition, every effort was made in the proposed organization to separate the research from the regulatory functions of an agency, and only include the former in the organization of DOST. The diffusion of Federal science and technology efforts in the U.S. among many agencies developed through, among other factors, the "turf","rice bowl" and "not-invented-here (NIH)" syndromes within government that has led to waste, duplication, poor focus and a dilution of resources.

At the outset of the next millennium and for at least a generation after that, the tremendous annual deficit and national debt burden of the United States will force us to overcome our turf battles and to consolidate our resources into one centralized department that can be more immediately responsive to research needs and which can speak to the world on Federal science and technology issues with one voice.

The DOST Organization

It is proposed that the initial organization of DOST include seven basic divisions or directorates below the Secretary/ executive level. The existing executive departments or agencies that would most logically be absorbed into a particular division are indicated in italics:

The U.S. Department of Science and Technology[1,11]

A. Secretary/Executive Level

Office of the Secretary, DOST

from the Executive Office of the President:

1. *Office of Science and Technology Policy(OSTP)*[2], and
2. *National Science and Technology Council (NSTC)*

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3. *National Science Foundation (NSF)* (to become a centralized grants/contracts office under the Secretary, or apportioned among the divisions below)

B. Operating Divisions

I. Division of Physical, Information, Computer Sciences and Mathematics

1. all basic research resources/sponsoring activities in this area from federal (including DOD) labs.

II. Division of Natural and Life Sciences

from the Department of Interior:

1. *U.S. Fish and Wildlife Service (research functions)*[3]

from the Department of Agriculture:

2. all functions from the *Science and Education Directorate* (all non-research functions of the Soil Conservation Service and Forest Service revert to a newly created Department of Natural Resources)

III. Division of Health, Medical and Social Sciences

from the Department of Health and Human Services:

1. *National Institutes of Health (NIH)*
2. *National Institutes of Mental Health (NIMH)*
3. *Centers for Disease Control (research functions only)*[4]

IV. Division of Earth & Space Sciences and Energy Research

from the Department of Interior:

1. *U.S. Geological Survey (USGS)*[3.]
2. *Bureau of Mines*

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3. *Environmental Protection Agency (EPA)*[5.]

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from the Department of Energy:

4. *DOE Science and Technology Programs, Energy Programs (part)*[6.]

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5. *National Aeronautics and Space Administration (NASA)*

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from the Department of Commerce:

6. *National Oceanic and Atmospheric Administration (NOAA)*[7.]

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from the Executive Office of the President:

7. *resources of the Council on Environmental Quality*

V. Division of Science and Technology Standards, Exchange, and Education

from the Department of Commerce:

1. *National Institute of Standards and Technology (NIST)*[8.]
2. *National Technical Information Service (NTIS)*
3. *Patent Office (or place in Applied Science Division below)*

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4. *Smithsonian Institution and related museums and facilities*

VI. Division of Applied Science, Technology and Engineering

from the Department of Commerce:

1. *National Institute of Standards and Technology (NIST)*[8.]
2. *Patent Office (or place in Standards Division above)*

from Congress:
3. *selected resources of the Office of Technology Assessment (OTA)*

VII. Division of Defense and Weapons Research[9.]

from the Defense Department:

1. *Director, Defense Research and Engineering (DDR&E)*
2. *Office of Naval Research (ONR), Army Research Office (ARO), and Air Force Office of Scientific Research (AFOSR)*
3. *Advanced Research Projects Agency (ARPA)*
4. *Naval Research Laboratory (NRL), Army Research Laboratory (ARL), and 6.1, 6.2, 6.3 (& 6.4?) functions of all other DOD laboratories*[9.]
5. *Defense Mapping Agency*
6. *Naval Oceanography Command; Naval Observatory*
7. *Army Corps of Engineers (research functions and laboratories only; remainder to be privatized)*
8. *Defense Technical Information Center (DTIC)*

from the Department of Energy:

9. *DOE Weapons Laboratories and laboratory management structure*[10.]

NOTES:

1. The separation of DOST into seven divisions based on grouping various fields of science and technology is, of course, an arbitrary one. It may be adjusted to better better fit the reality of the situation. For example, Information and Computer Sciences could be a separate division, Social Sciences might also be grouped with Natural & Life Sciences,energy research could be placed in the Applied Science division, etc.

2. The independent science and technology advisers to the President and Secretary of DOST would now devolve to the National Academy of Sciences and the National Academy of Engineering.

3. The question as to whether the Fish and Wildlife Service and the Geological Survey more properly belong in a newly created Department of Natural Resources (created from the bulk of divisions within the Interior and Agriculture departments and some functions of EPA and Energy) is still open to question.

4. The operational/enforcement/regulatory functions of the Centers for Disease and the Food and Drug Administration would continue to reside in the newly reconstituted Department of Health, Education and Social Welfare.

5. The research functions of EPA would be absorbed into this division; hazardous waste cleanup efforts would revert to a Safety Division of the reconstituted Department of Health, Education and Social Welfare.

6. DOE's S&T Programs and the research functions of Energy Programs would be absorbed into DOST; part of the DOE's Energy Programs office would revert to a new Department of Natural Resources, and the Weapons laboratories and research efforts would be absorbed into the Defense and Weapons Research Division of DOST.

7. Part of the functions of the National Weather Service will be subject to possible privatization.

8. The NIST functions having to do with standards would be transferred to Standards Division, those dealing with technology and new manufacturing techniques would be transferred to the Applied Science Division.

9. This division may be headed, on a rotational basis, by military Directors.
It is understood that this division may engage in classified research. The intention is for this division of DOST to carry out applied research of interest to DOD, including advanced development and/ or engineering development (the 6.3 and 6.4 categories of R&D), and then turn the development over to DOD for production/procurement and testing. Any 6.1 (Basic Research) now done in DOD labs would revert to the appropriate division of DOST, any 6.2 (Exploratory Development) would revert to the Applied Science Division of DOST. Duplicate efforts among the services would be eliminated/consolidated.

10. The DOE-managed nuclear weapons laboratories will be reviewed for complete or partial close-down.

11. The DOST would be part of the re-organized executive branch which would consist of the following:
Executive Office of the President, and the Departments of:
1. Commerce, Industry and Economic Development (CIED)_
2. Defense (DOD)
3. Health, Education and Social Welfare (HESW)
4. International Relations (DIR)
5. Justice (DOJ)
6. Natural Resources (DONR)
7. Science and Technology (DOST)
8. Transportation and Communication (DOTC)
9. Treasury (DOT)

The CHAIRMAN. Mr. Brown.

Mr. BROWN. Thank you, Mr. Chairman, and I, too, appreciate your testimony very much. The logical way in which you present a structure for bringing together these various functions lends credibility to the proposal to go ahead in this direction.

There are a number of issues that I would like to spend more time on, but let me select just one here, and it actually stems from your last statement about wanting to include technology in the name of the department to emphasize the linkages with industry and competitiveness. Earlier speakers had made some references to the question of applied research which, of course, moves us in the direction of technology development. Both Mr. Moore and Dr. Keyworth indicated some role for applied research.

Now, this is a part of our problem here. This was a part of the problem which occurred after World War II when a similar proposal to include military research and health research was made and resisted by the Congress because in part the research being considered was applied research which was tightly coupled to the mission of the agencies.

The agencies didn't want to lose control of the applied research. You look at DOD which funds about half of all Federal R&D. About 90 percent of what they fund is applied and about 10 percent is basic.

The NIH, which contends that it is a basic research agency, they are defending their budget on the ground of the prompt response they can make to a cure for Alzheimer which is a very practical and applied kind of thing. I am not quibbling with them over words. It turns out that basic health research is more tightly coupled to applications than most areas of research, but still there is a large element of application here.

So that in considering the desirability of establishing a Department of Science and Technology and the mission of that department, you have to also consider the policy problem of whether the Federal Government should be involved in applied research and technology development.

If it is strictly basic research, I think you can make a much more compelling argument if you suitably define basic research for putting it all together under a coordinated structure. After all, every university does that. They coordinate all of the basic research going on within the university in one way or another. It doesn't look very well coordinated sometimes, but the issue that divides our committee frequently is the degree to which the Federal Government should fund basic versus applied research.

So I am asking you to comment briefly, or a little more fully, on that subject and how you perceive the role or the dividing line or the acceptability of funding applied research as well as basic research as part of a function of this department.

Dr. SPIGAI. Well, sir, the function of basic research is just the expansion of knowledge, and applied research, to use the DOD breakdown, basic research is the six one area, and then six two would be exploratory development; six three, and so on.

Sometimes it is very difficult to make a break between doing research that is totally fundamental, that is, has no absolute applied purpose or reason other than to expand knowledge, but I believe that the department should include both that area as well as those things like the National Institutes of Standards and Technology and all of the other applied areas in the government because it is difficult to make the break because the fundamental knowledge that we gain must be applied, and I think an agency that can make the transition between the basic research and the applied research, all under one roof, would be much more efficient than having it fragmented.

That may be a rather diffuse answer, but my feeling is that the transition between basic and applied research, if it is under one department, would take place much more smoothly than in a fragmented sense, and that is how I can answer that, sir.

Mr. BROWN. Well, we are not going to convince anybody that there is a final and absolute answer to that question. What we are hoping to do with hearings like this, I think, is to expand our thinking about the subject and come to some more rational views with regard to what the proper course should be.

I hear that buzzer ringing, Mr. Chairman.

The CHAIRMAN. If you have additional questions, we can come back to you after we have gone to the other Members.

Mr. MOORE. Mr. Chairman, I would like to take a crack at simply answering that question from the point of view of applied research, from the point of view that the department I served in did a good deal of applied research, and it was because there was a valid Federal policy behind it—environment, energy, whatever—that it wasn't going to happen in the private marketplace because it just wasn't commercially feasible. If you got it somewhere down the road; I am looking at the battery consortium we initiated with the auto makers to develop finally an ultimate battery that would make an electric car a viable, commercial enterprise, and we put up part of the money and they did the rest, but the work in solar energy and many of the things we did, that was because—and there is a fine line, and you know the fine line as well or better than anybody, whether you are getting off in industrial planning and doing things that industry ought to do or whatever.

But there are, I learned firsthand, and that was the reason why I made that comment in my remarks, that there are some applied projects that there is a valid Federal policy behind it about wanting to see that that happens; that if you just left it up to industry, it might never happen.

I am not talking about—in my thinking I am not talking about competitiveness. We did go through that in the Bush Administration, remember, with high definition television. There are some examples of that, but that was not what I was speaking to.

What I was speaking to are things that this Congress and the American people and the President determined there was some valid reason to pursue it on an applied basis.

Mr. BROWN. Would the Chair allow me to respond briefly?

Mr. Moore, I think you and I are both searching for a valid, pragmatic course to follow here. The higher definition television has been interpreted both as a success and as a failure on the part of government support, and properly so, I have no doubt, but the history of the Federal role in the support of R&D has invariably been, and this goes back a hundred years, first at the practical or applied research that would positively benefit the country.

The first research on the safety of steam boilers, for example, was not to find out basic thermodynamics but how to make better steam boilers. The development of agriculture the same way, how to do better farming.

Basic research drew its primary emphasis during World War II when you found that applied research could function better if you developed a basic research foundation on which to build the applied research.

We are still struggling with that question of how you draw those kinds of lines.

The CHAIRMAN. Mr. Weldon.

Mr. WELDON. I thank the Chairman, and preceding any questions I might ask, I would just like to make a couple of general comments.

I think the idea of a Federal Department of Science is timely for our nation today. The United States emerged as the world leader in science and technology in the period around World War II and following, I think to a great degree as a consequence of the tremendous size of our economy.

We hold that position today, I think, somewhat precariously in that many other nations today are emerging as very powerful economies and they are capable and able to fund very extensive research and development programs, and in the emerging, very, very competitive global marketplace, in order for the United States to remain, I believe, the world's leader in science and technology, we need to at least here at the Federal level begin to start rethinking how we are doing things and what we can do to make sure that the United States maintains its leadership position.

The overall mood here on Capitol Hill is to reduce the number of Cabinet level agencies, and I think appropriately so. Dr. Spigai, you, I think, in your proposal came forward with an idea of reducing it from 14 to 9, I believe.

Dr. SPIGAI. That is correct, sir.

Mr. WELDON. Could you just amplify a little specifically how you would go about doing that?

Dr. SPIGAI. I would be happy to. My proposal calls for a reduction, as you say, from 14 Cabinet departments to 9, and the 9 that I have come up with are as follows. I would not do away with or abolish the Commerce Department. Instead I would transform it into a Department of Commerce, Industry, and Economic Development because I think international trade and commerce is a key issue in today's world, and I believe that commerce in that sense deserves to remain so my first department is Commerce, Industry, and Economic Development.

The Department of Defense would remain. I would meld into the Department of Health and Human Services and rename it back to—similar to what it was before, and call it the Health, Education, and Social Welfare Department, putting into it the Department of Education.

The fourth department would be the Department of State which I would rename the Department of International Relations. I am not sure if that—that was just my personal preference.

The fifth department, the Department of Justice. The sixth department would be a combination of the Agriculture Department and the Interior Department which I would call the Department of Natural Resources.

The seventh department, the Department of Science and Technology which I have an expanded proposal.

The eighth would be the combination of the Department of Transportation and Communication. I believe that communication deserves a place—particularly telecommunications deserves a place at the Cabinet level in the 21st century.

And the ninth and last would be the Treasury Department, and those would be the nine departments that would remain.

The Energy Department is not there, and neither is the Education Department and several others, but that breaks it down from 14 to 9.

Mr. WELDON. Thank you. That is a very interesting proposal. I think the importance of incorporating something like that into a proposal for a Science Department can't be overestimated in light of the environment that we are working in.

An unrelated question for Mr. Ritter. In my undergraduate and graduate training as well as in my internship and residency, one of the things I always noticed was that the best teachers were frequently the best researchers who frequently spent the majority of their time pursuing educational grants or research grants so as a consequence they were never available for teaching. They were basically not seen.

Do you see the creation of a Science Department as a way that some of these kinds of issues within research and training could, perhaps, be better addressed? Because I saw that as a problem, at least in my experience.

Mr. RITTER. I think we need to get away, Mr. Weldon, from these departments being viewed as simply paymasters. In other words, they are pots of money for the American people to come running to Washington to get funding for their programs and proposals. Then the whole thing becomes something of a political process although certain agencies do better peer review than others. Some of them do terribly at peer review.

But when you get away from just being a paymaster for research and you begin to get into setting priorities for the country, you begin to get into the idea of protecting the quality and the integrity of science in the legislative and regulatory process, something we haven't seen in 20 years. You begin to get into things like in funding the training of Ph.D.s, which has really become a Federal role, you begin to get into what kind of training you are funding.

What have you done? What has been the side effect, perhaps, of this paymaster process? One of the side effects is a major impact on undergraduate education, anybody studying science and engineering, and you are absolutely right.

The time spent by faculty members seeking money is so enormous. It is a great and large secret, but if you go into a university, a great university, and you talk to faculty members, you will find that most of the really topnotch faculty members are spending half their time trying to get research grants to pay for their half time which is spent on research, or two-thirds time, really. The really great professors are spending two-thirds time on research.

The CHAIRMAN. The time of the gentleman has expired.

Mr. WELDON. I thank the Chairman.

Mr. RITTER. So, yes, a Science Department could look into issues like that. It wouldn't just write checks.

The CHAIRMAN. Mr. Tiahrt.

Mr. TIAHRT. Thank you, Mr. Chairman. I appreciate these hearings. I think they are very interesting. Just looking over—is it Dr. Spigai's testimony, and I think the ratio is about right, going from 9 to 14, and I have a proposal to eliminate one of those. That is the Department of Energy.

A portion of that talks about consolidation of the labs within the Department of Energy. There are nine major labs, a total of about 30 when you put in some of the single purpose labs, and I think that you are probably familiar with Dr. Galvin's report about how he set up this—did a study and had some recommendation of corporatizing these labs, and some of that is part of the concept that we are struggling with.

As part of this Committee, you know, we listen to the labs, or review the budgets for the labs and want to see the best value for the American taxpayer getting into those labs.

Perhaps a focus of a Department of Science and Technology in this consolidated structure that you are proposing would give us a vehicle of making sure that we have good value for this wonderful investment that we have and a national resource, and we are very proud of the things that they have created.

But in your opinion do you think that this type of—how would this consolidation—and you talked about the BRAC-like Commission. Would you include just Department of Energy labs, or because you are expanding your view to all—to a Department of Science and Technology, would you include all government labs in a similar type of process?

Dr. SPIGAI. Yes, I would, sir. Absolutely. DOE labs, those that remained after we either consolidated or eliminated some or privatized some. It is just a small part. I would include DOD labs, as I mentioned in my statement.

I would like to see the Department of Science and Technology eventually include NIH and the medical and health laboratories and also the Defense-related basic and applied research laboratories.

So the short answer is yes, all laboratories because I think if we are going to speak with one voice, let's speak with one voice. Let's have the agencies—let's have the policy, the funding, and the implementing agencies to transition from basic to applied research in one roof, and let the Secretary of Science and Technology speak for the nation with one voice.

Mr. TIAHRT. One of the interesting things when I read the Galvin report is that after looking at the major labs, he saw no reason to get rid of any of those nine major labs. He thought the problem wasn't so much that they didn't have enough work. The problem was in the decisionmaking process on which research and development was going to be followed, the process of reviewing the work that is being done, and I come out of an environment where engineers and scientists have a ratio to management of about one manager for every 15 or so engineers and scientists.

When we look at the ratio in the labs, and I am having a hard time getting that ratio because I am not sure anyone really knows, but it seems like the overhead is very cumbersome, very big, and the best value for the American taxpayer is not being realized because of that wasted time.

We need to have more engineering bench hours, scientist bench hours, and less program reviews. I have heard people talking about just the review process on a simple proposal, the telecommunications or phone line to review the proposal had 15 people in the lab structure reviewing what one guy was trying to present on the other end of the phone line, and it seemed a little cumbersome.

Do you think we could streamline the structure, the decision process, through focusing on a consolidated or a focused department like a Department of Science and Technology?

Dr. SPIGAI. Sir, I think you answered your own question. The answer is undoubtedly yes. Just the savings in eliminating duplicative administrative functions would be enormous and cutting out extra steps would streamline the process so the answer, in short, is yes.

Mr. TIAHRT. Does anyone else have any comments about how we could streamline that process? Mr. Moore.

Mr. MOORE. Within the Department of Energy you have obviously got three laboratories that perform basically a Defense function. That is what they are best at. They are trying to do something else. The question is do you need three doing the Defense function, first of all.

We had begun a study in DOE. The study was almost finished by the time we left. I don't know where it is today, but we came basically to the conclusion that we didn't need but two and began to reorganize. One lab would simply fall out of the three. You have got a political problem which, one, is the Congress going to allow that third lab to essentially go out of business or be spun off or sold or whatever?

There are many laboratories in DOE, those that are primarily used to do civilian type research projects. The question is how many of them need to survive. I think you are dealing with an issue of not just how to run them. They tend to run themselves, and they tend to run to Congress to see to it they run themselves. They have an outstanding cadre of scientists there. At one time the Department of Energy boasted when I was there that it employed more Ph.D.s than any institution in the world.

Many of them are in these laboratories, and they are brilliant, and they do great work, but the situation is that you are threatening them when you talk about putting them in one department. You are threatening them when you talk about streamlining their management. They don't want that or they would have been here a long time ago working with you or working with people that run DOE to get that.

I think the answer to your question is yes, you can do it, but you have got to deal with some very basic decisions. It may well be that some people are talking about, I understand, here on the Hill, some kind of a base closure kind of commission that would look at these laboratories. That may be what it is going to take because of the politics. In dealing with these laboratories they are not unlike a military base in the sense that they provide jobs. They provide prestige to a Congressional district, and they provide a flow of money, and the question is, do you need them all to do the same thing.

I think the answer is no, and how you deal with that, certainly, I think getting to a department will help with that, but you are still going to be faced with these basic political decisions even within a department because they are within DOE now and you can't deal with it.

The CHAIRMAN. The time of the gentleman has expired.

Mr. RITTER. Can I just add to that, to Henson's last comment? The department could help set priorities. It could generate some authority that is new and different beyond the current political makeup of this process which is guaranteed for continuation so if you, I guess, shake things up a little bit, if you reorganize, if you create new authorities, then you set priorities. Then some of the rationale for keeping XYZ Lab at this level or that level becomes more apparent.

The CHAIRMAN. Mr. Baker.

Mr. BAKER. Thank you very much, Mr. Chairman. I am surprised that after we watched the death throes of the BRAC Commission we would suggest to take that process and throw it on the scientific community.

To me the BRAC Commission made its low water mark when they closed every base in the Bay area in California, including a Naval Base that had three deep water ports, and agreed to build a brand new one in Washington State. That was the savings. It is a political football. We have retired politicians, some of them retired by the voters, serving on that Commission with no great expertise. They are basically trying to rubber stamp what the Defense Department wants to do to streamline.

So I think there is a better way to look at this than some BRAC Commission that takes decisionmaking out of the hands of the Congress and hopefully does it like Solomon; that is, give them a budget and let them work among themselves to decide which is the expert in lasers, which is the expert in cyclotrons, which is the expert in which area. Give them a budget.

The Defense expenditure in the DOE labs is down about 50 percent over the last five years. We are going to have a shake-up, but the Department of Energy and the labs can determine who does it best and at what expense. You may not have to close the laboratories to do that.

You also don't want to get down to the point where you have one Defense lab because who is watching the watchers? We have saved a lot of huge mistakes by having several labs looking over each other's shoulders. I think if we define what we want the labs to do, which is what Chairman Walker is trying to do in his mission statement, and assign them a certain budget, then things like the waste and the inefficiencies are going to fall out just as they have in the private sector.

We are the only sector in the world that hasn't downsized, government, and it is now coming. It took a 1994 election to bring this about, but it is coming so you don't need special commissions. You don't need political hacks doing the job that we have to do.

The Department of Energy can determine how much money they are going to have and what kind of research they want from that.

Would you comment on my remarks, starting on the left? Dr. Spigai.

Dr. SPIGAI. I won't, sir, except to say that I believe you may be a little more optimistic about the budget, the use of the budget as a tool to think things out rather than a bill that creates an infrastructure.

Mr. BAKER. Have you met Mr. Rohrabacher yet?

Dr. SPIGAI. No, sir, I haven't.

Mr. BAKER. That is the thinning out.

Dr. SPIGAI. I will let the other witnesses comment further.

Mr. MOORE. That situation exists now. It did the three years I was there. You are given a budget. The budget was declining every year. The fact of the matter was, politically, at least in the Congresses we dealt with it was not possible to essentially do what you had to do.

As a matter of fact you couldn't even get scientists to agree what was to be done away with because the scientists themselves were loathe to point the finger at another scientist and say, "Your regimen or your project is one we don't need any more." They try to find a way to finesse that, figuring that we would be gone in three or four years. There would be a new group in, and perhaps they could do better with the new group.

This is just the way the world works in politics so I think what you are saying, Congressman, is totally correct, but that situation exists now. It existed last year. It has existed the last ten or fifteen years, and you haven't seen it happen yet, and there has been pressure on money all of those years, generally speaking.

Mr. RITTER. Dana Rohrabacher was here. Of course, he was in the majority.

Mr. MOORE. But let me say that I think that perhaps if you had a Department of Science and Technology or whatever we call it, and the centralization of these functions, then perhaps you might find the Executive Branch doing what it is not doing, and that is what you think it should do, and you are correct. That is what it ought to do which is sit down and begin to set priorities and begin to use the money wisely.

Mr. BAKER. Let me introduce my second theorem. That is let the marketplace work. I opened up the Washington Times today to find out that Sandia Labs just helped the automotive industry introduce a new airbag which is lighter, fills faster, works better. I will lay you odds that we are not a partner, and when those airbags are sold the government doesn't receive a cent.

I think if we begin licensing and become a part of the profit that we will see research functions that are more applied, that are not as blue sky.

Mr. MOORE. Well, that is a two-edged sword. One, I can say one of the things we did successfully accomplish is the regulation in place that I largely spearheaded to make that happen, that we be a licensee and we be paid for it, and I caught nothing but hell from everybody for doing that.

Nobody was in favor of that, basically; OMB, the Congress, much less the laboratories or much less the people that did it, but we forced it through, and so that is supposedly still there unless it has been rescinded.

But I am not too terribly sure—and I go back to Congressman Brown's comments—if the proper role of the Department of Science and Technology is to become a research partner for all of business and industry to develop applied products. I am not sure that is the role. That gets into that old debate. That is another debate.

Mr. BAKER. My time is up, but let me just suggest to you the role is being fulfilled. The only thing missing is our participating in the profits which would give us a stream of revenue for applied science and basic science. So we are already doing it. Sandia Lab already did the work. They are a Defense lab, right? They already did the work for the auto industry. It is a question of whether we are going to participate and have more funds for the future.

Mr. MOORE. I think we ought to get Committee staff to find out if there is a licensing agreement in place on that one, if there is a regulation.

The CHAIRMAN. The time of the gentleman has expired. Ms. McCarthy.

Ms. MCCARTHY. Thank you, Mr. Chairman. I appreciate the frankness with which each of you gentlemen is sharing your thoughts with the Committee today. I come from a very strong background in state government. I am particularly excited about this Congress devolving power back out to the states and the local governments and particularly in the area of science which I feel has worked exceptionally well in a decentralized environment.

I am somewhat miffed by your advocacy of putting all of that back together in greater centralization under the Federal Government. I wonder if you could reflect with me on what benefits would be gained by replacing these small agencies with a larger agency responsible for their multiple missions and also what trade-offs this will create.

Mr. RITTER. I will take a crack at that. I agree with you. I think it is exciting what is happening now in devolving these powers back to the states, and the states—I talked about pluralism in science and technology. It is out there, and the states have plenty of it.

The question here is not whether you are taking away authority from the states. The question is whether you are going to make some more intelligent combination of that which exists at the Federal level which, indeed, when you think of a new department, could have a component to it that related much more closely with the states than the myriad of fragmented parts and parcels struggling for survival and a budget.

It could conceivably, if it was done right, have a more salutary effect on the burgeoning science and technology capacity that one finds out at the state level which is also closely connected to the pluralistic science and technology capacity which is existing in industry, which is generally far more sophisticated than that which exists here.

Mr. MOORE. I agree with those comments.

Ms. McCarthy. Please, Mr. Moore. I would like to pursue with you, since you were at the DOE, how you reconcile that since so many have expressed dissatisfaction with the DOE, a centralized Federal agency, instead of the diversity that we just spoke to within the states.

Mr. Moore. Well, that is a difficult question to answer. Let me try by simply saying that I saw when I was at DOE that its real mission for the future was not so much energy policy or that sort of thing. The reason why that department was created back in the years of President Carter changed dramatically, and all of its roles are changed, from a regulator and a big spender of exotic engineering projects and whatever. All of that was largely out the window, and what was left was a department that had a big Defense function to test and build nuclear weapons for the United States and its science and technology mission.

The science and technology mission was one that I didn't see any other department in the government that looked like it could evolve itself into a Department of Science and Technology but the Department of Energy and so that was my thought. That was the game plan we pursued, and the idea was, and I agree with Don Ritter's comments, if the Federal Government is to have a role—and we are not arguing what to give back to the states; that is up to the Congress, and we certainly agree, I certainly agree with defederalization—but whatever is left in the Federal Government—and I think there will be something left. I don't think we are going to ask New Jersey to build nuclear bombs. I don't think we are going to ask California to do all the research on cancer.

I think there is going to be some role left for the Federal Government in all of this, and what we are saying is that the role ought to be centralized if you are really going to get the greatest efficiency for the taxpayer out of it.

Ms. McCarthy. Mr. Moore, would you speak, then, very briefly, to why we should be more confident that a Department of Science will not fall prey to the same problems that the Department of Energy did when it attempted to manage research and development in a wide variety of scientific fields?

Mr. Moore. I am not sure I know what the criticism is of the function of the science at the Department of Energy. I think it has done largely what the Congress told it to do. It isn't in a coordinating role today. It has had some great success as the human genome project that it is doing. It is accomplishing it quite well. The work it has done in working with people in solar energy and things like that it has done quite well. Its work in high energy physics has been done extremely well.

I am not sure what the criticism is of the level of that science, but I think the criticism is that it didn't coordinate it with everybody else in the field of government. It probably isn't being efficiently sent, and that it really hasn't built itself into a Department of Science and Technology. It is still functioning as it did the day that President Carter and the Congress threw a bunch of assorted functions together and called it the Department of Energy.

Ms. McCarthy. I can appreciate that because it seems to me the frustration that many of us feel is its failure to manage these competing scientific interests which was its charge, but which it never really fully successfully managed to do, and I would like to make sure in creating a new department that we don't go down that same path again.

I thank you for your insights.

Mr. MOORE. You have a valid comment there. I think all of us agree with you. I don't believe—it was my experience in trying to manage these projects—I don't believe we successfully managed them in the most efficient way possible, and you are totally correct.

How would a new department do that any better? The only solution I can give is if you put it all together and have a central function and a President who is expecting his Secretary to do that; just perhaps you will find through that centralization and the increased emphasis you put on it a better situation than you have today.

I am not sure it is going to ever be totally perfect because we are dealing in politics. There is always going to be a Congress that will have its ideas about what ought to be done and not done so I am not sure it is ever going to get to be run like a Bell Lab.

Ms. MCCARTHY. I thank you for your answers. Thank you, Mr. Chairman.

The CHAIRMAN. The time of the gentlelady has expired.

Mr. Luther.

Mr. LUTHER. Thank you very much, Mr. Chairman. I appreciate the opportunity, and thank you, Members of the Panel.

I just want to follow up, really, on the questions that have already been presented. I think from some of you I have gotten your impressions of this, but assuming that we are in this downsizing mode, and I think that is a given—kind of a reworking mode, if you will.

I suppose in the perfect world if budget constraint came into play so there were less resources, those resources in the perfect world would then get allocated in the best possible way for the maximum benefit for the public good.

I tend to agree with those comments here to the effect that there is so much more involved here that we can't just assume that that will occur.

In other words, if the Congress decides that we are going to have less resources to apply in this area versus other areas, I don't think it is fair to assume without making sure we see what structure we have out there—it is not fair to assume that that is just going to occur on its own, particularly when we are in a downsizing mode, because we have had this infrastructure in place.

What process—I know this has been answered, but what process do we go through here, just to step back for a moment, to insure that we preserve the functions that are of most utility to us, that we set up a process for developing the right priorities in this mode that we are now in?

Just setting aside this whole concern about the science setting up a separate department for a moment, what is the process we should use as policymakers to step back in the particular climate we are in now to attempt to preserve the functions we need to preserve and to maximize the dollars that are going to be available?

Dr. SPIGAI. Let me try to answer that first, and then I will pass to the other gentlemen.

It seems to me that we have to try to make objective the setting of priorities, as objective as we can. I said it in my statement, that relative to a Department of Science we should provide for the Secretary a framework by which he gets objective policy advice from such organizations as the National Academy of Sciences and the National Academy of Engineering, taking it out of the realm, if you will, of the department and giving the Secretary objective lists—say the NAS or NAE's top ten list, and saying, "These are the research areas that we should fund."

Now, the Secretary could have full authority to fund any of them or perhaps limited authority or discretion to fund the top five or whatever and discretion to fund others as funds are available, but I think if we take the recommendations for what are the key areas and put that in a body that is supposedly experienced and objective such as the National Academy of Sciences and the National Academy of Engineering, we would go a long way because these people are the experts, and if we have a mechanism by which they provide formally advice to the Secretary, I think we would go a long way to getting—removing that process from political influence as much as we can and making it objective.

Mr. MOORE. What I think that a new Department of Science and Technology would bring to the table that is not there now is one government agency that is supposed to be doing this instead of the plethora that you have out there now, and that one government agency would be expected to come forward with a vision. It would be expected to prioritize projects based on that vision. It would be expected to come forward with a research plan on how it intends to approach these things, and then specific projects emanating out of that plan.

The Congress then has oversight over that and decides whether it agrees or not and whether it agrees to fund it or not.

Today you don't have any of those four things, in my humble opinion, from my experience. There isn't any central vision, and there isn't any central prioritization of projects. There is no plan for what we are really going to be working on, and there certainly are specific projects that come out of it that grew up, as I indicated, very often by the independent agencies having something they want to do and not lose turf and not lose revenues for, rather than really getting into what you are driving at, which is the right question.

As Don leaned over and said, your question is the sixty-four dollar question. I think that is why we are saying a department gives you a mechanism to bring all that in one place so that you, the Congress, can begin to give oversight to see to it what you are saying is being done. It is our opinion it isn't being done now.

Mr. RITTER. I think if I could add, it was $64,000, Henson, three orders of magnitude.

I just want to add I think Henson is dead right. I think, taking a page from Mr. Baker's book, I think with budget authority—and that is really going to be the defining instrument here because that is what talks, budget—if you can deal with the different organizations and bring them in on the rationalization process, you will wreak the least havoc and create the least damage in the downsizing effort.

But eventually you are going to get down to a budget following the Moore principles and working with the—I hate to say victims, but the constituencies, you can come to some kind of rationalization of this process.

The CHAIRMAN. Mr. Doyle.

Mr. DOYLE. I have no questions.

The CHAIRMAN. Thank you. I think Mr. Luther has led us into an interesting discussion because, I mean, part of what we are talking about here is not only downsizing government. We are talking about restructuring and rescoping government to fit the needs of the 21st century.

The issue is if you take a look at what now exists with the executive agencies, many of those things wouldn't have been done in the 19th century because we didn't even know in the 19th century that some of those things were national needs, yet we have retained much of what we formed in the 19th century, added to it in the 20th century, and haven't bothered to rescope and restructure government based upon the needs of the 21st century.

Part of the issue here is not just downsizing government but rescoping government so that you can make the right kinds of priority decisions.

It seems to me one of the things we have to be about on this Committee is looking to see whether or not science fits into a category that is a 21st century category, as you restructure and rescope government, that you want to have an emphasis in that particular area.

I think the gentleman has asked the right question, and it is a question that we are going to continue to ask in this hearing process.

Mr. RITTER. Mr. Chairman, if I might add I think that is the real meaning of this hearing and this whole department debate, is what is the 21st century role for science as it relates to the Federal national responsibility.

The CHAIRMAN. The real question is even larger than that. The real question that we have to answer as a Congress is what is the role of the Federal Government in the 21st century. Then one of the things that we have to ask in this Committee is what role does science play in terms of the overall mission, and is there a science function within that Federal Government mission, and then how is that properly structured within the Federal establishment?

I mean, you are right. That is a very, very key question.

You raised, Don, in your testimony, the sentence here I would like to explore with you a little bit further because I think it goes to the heart of some of the question. You say maybe a Department of Science is a case of national priorities versus interest group politics.

It strikes me that that is one of the questions we have to answer here is whether or not we have structured a science establishment in the government based upon a variety of interest group politics that then have ended up with their own little science establishment within the government that they have fed and kept as kind of their pet, regardless of whether or not that had anything to do with the overall coordination of science politics; and whether or not it isn't time to have national priority setting drive the determination of science priorities rather than a series of subcommittees scattered around the Hill and a series of small agencies scattered throughout the government, all of whom have a science mission and are justifying that on the basis of diversity, but it may, in fact, be diversity that has no relationship whatsoever to national priority.

Would you comment further on that?

Mr. RITTER. That is an interesting observation. I think at some point all of it did have a relationship to national priority. You couldn't get a big project into subcommittee, into a major program in the Federal Government, unless it met some perceived national need, but as you pointed out earlier, these national needs switch. They change, and yet the structure stays the same.

Why? Because the interest groups, who did good work, actually, implementing and fostering those particular lines of science and research and development are not going to relinquish anytime soon or voluntarily that which is bringing them support for their livelihoods.

So one of the ideas behind restructuring is in a new department setting priorities, dealing with some of the points that Henson made, you can get around, you can bring these people along. You can switch and change things without taking them on hammer and tongs, frontally and directly, because they are now part of this new institution as well, and I think there is the potential for reducing the problem.

There is one thing you have got to watch out for. Decentralization is what is happening in the science and technology establishment or community. It is all over America, and I think any new Science Department in focusing and in concentrating to set priorities has to be first and foremost aware of that diversity and decentralization in the community.

The CHAIRMAN. In fact, I think that that is a major concern. In all honesty, as somebody who is advocating the concept, it is a concern of mine, and when we talked earlier in this hearing about the risks that you take in moving in this direction, I think that is the risk we have to look at, is whether or not by centralizing the decisionmaking in government whether or not you would have, in fact, gone a different direction from where the economy and the rest of the country is going.

Mr. RITTER. The only point in your favor there is that the economy has gone in quite different directions from our organization. We have a Department of Energy now, and frankly, as Henson points out, some of the research that is going on in these labs does not have anything to do with energy, and it is some of the finest science in America that is taking place, but it is a Department of Energy. Why? Because it has been a Department of Energy.

The CHAIRMAN. It is kind of hard to relate specifically the human genome project, which the Department of Energy has done very well, but to relate that to the energy mission that was envisioned for the department, but it is obviously one of the most significant science missions that we have undertaken as a nation in the 20th century.

Mr. RITTER. The Department of Energy is the living, breathing—while it may seem contradictory it is the living, breathing example of need to do what this Committee is trying to do or is investigating.

Mr. MOORE. Precisely the observations being made, precisely why I tried to do that while I was there. It became very obvious that it really was the closest thing we had to a Department of Science and Technology. If it had the other pieces put into it and had its role clarified a bit and backed it out of a few things, you would have what essentially we are talking about today.

The CHAIRMAN. I think you are right. To follow up on this, Dr. Spigai, I was interested in then your addressing the plurality issue because, again, I mean, I think that is a very important issue. I think it was you that pointed out that Dr. Gibbons has made quite a point about this.

I was interested in the fact that you have a kind of a broader view of the whole question of plurality and diversity.

I thought that was a very useful contribution. The only thing I would suggest is that one of the things that I hear, at least from scientists, is that since the Federal Government does play a very, very important role in university research right now, whether it is through the Department of Energy, whether it is through National Science Foundation, whether it is through NASA or whatever, scientists do like the idea that if their project is turned down at one place in the Federal Government, they do have some other places to go to offer this as an idea that somebody else might like, and to lose—to suggest that there is only one-stop shopping in the Federal Government is, in fact, something that might lose us some pretty good project ideas.

How would you respond to that?

Dr. SPIGAI. In the example I cited in reality, in my experience, for example, at the Office of Naval Research there was, in fact, not by design but by the efforts of the individuals an effort not to duplicate our collective endeavors.

We consulted as to what areas each of us would take, what researchers we would fund, so that if a researcher was turned down at ONR, chances are he wouldn't be funded at NSF and vice versa in the area of ocean science.

Now, in other areas I can't speak to. So there was an attempt to consolidate, but then again, going back to my definition of plurality, if a scientist is turned down in the arena of Federal science, I believe that the arena is very large. States and local governments, for example, private institutions, technical societies—I don't think that we can say that there is one-stop shopping.

There may be one-stop shopping at the Federal level, but that doesn't mean that that researcher goes without funds. He has got lots of other areas and arenas to search, and I think that is the narrowness of view that is one of the biggest objections to your bill.

The CHAIRMAN. Let me pose it, though, from another side. I think that that is helpful, but the other thing that may be said is, if, in fact, you have a one-stop shopping area in the Federal Government for science and technology, the tendency would be then to have only one researcher doing work in a particular area, that once you had made a determination that somebody was going to pursue this particular set of objectives, the chances are that when you were prioritizing these things you would end up with some official saying, “Well, we are already doing work in that area. We shouldn’t authorize another project in the same area.”

In my view that could also be bad for science because obviously there are some areas where you are looking for new knowledge, for example, that you want a variety of different people doing work in the same general area who are applying very unique skills to the research.

Dr. SPIGAI. Absolutely right, Mr. Chairman. There is no reason why, just because there is one program officer for high energy physics, for example, that he or she couldn’t fund a number of researchers competing with one another with the same amount of money to see which one got the best solution first or which one got the better solution.

So the competitiveness could be engendered just through having one person.

The CHAIRMAN. Mr. Moore.

Mr. MOORE. Let me speak to that. In fact, the doctor is correct. When we would initiate research projects at DOE, in the very first stages you would have what we would call a fly-off. You would grant three or four people, competing people, a certain timeframe, a certain amount of money, to bring their idea, particularly in high energy physics up to a certain stage.

You got it narrowed down, and you went to a final stage where you went with what you thought was the best technology or the best project and went from there.

That was part of a plan. If you had this pluralism where you had four or five agencies putting out money on this, it would be, I think, even more efficient than it is today.

We ran into that between the Department of Energy and EPA. We were working on the best new fuels. We were working on things that would be more energy efficient. We found out that we were spending money on the same things, totally unorganized.

Now, pluralism is a good idea. Maybe we ought to have more than one place you can go to for a social security check if you get turned down by the Social Security Agency, which happens all the time. Let’s go try the one over here across the street. That is a little bit different. Maybe we can get a check there, and we have all dealt with that on behalf of constituents.

So I am not sure pluralism is what it is cracked up to be. It can be inefficient, but as the doctor says, if you are running a research plan right, you don’t sit down and make a Solomonistic choice of one person and put all of your money on that. You normally have a fly-off, is our experience.

The CHAIRMAN. I think that is very useful. Let me carry it one step further because we are getting some useful information here.

Dr. Spigai, you then said that we ought to include the health and defense functions under this department to make certain that the health and defense research are going on under this department.

Let me suggest to you at least the reasoning why they are not included in the bill that we presently have before us.

In the case of health the moment you run into a national emergency such as an epidemic, AIDS being an example, the tendency of Congress is to take all of the money and place it into that particular national emergency. If you have all of this combined in one department, the chances of that being peeled off of other very necessary basic research being done are pretty great.

In the defense area, as Dr. Keyworth said earlier, this is a major national item, our own security. The chances of the defense eating alive a lot of the other civilian research programs, if you include it within this department, are pretty great.

So the question is whether or not by including those two things you haven't, in fact, undermined the kind of work that today the National Science Foundation does, that the Energy Research and Development Administration within the Energy Department does. You know, is that a legitimate concern?

Dr. SPIGAI. Yes, sir, it is. Obviously, I am dealing from the ideal and you are dealing from what is realistic. My ideal organization would include all general science and technology areas, but if, in fact, the realities of the funding battles prevent that, then we have to go, at least initially, with what we can do.

Eventually, perhaps, that climate may not exist. So I appreciate the dilemma of looking at real life as opposed to my ideal view.

The CHAIRMAN. But your ideal is very interesting because I like your nine departments and so on. It is the kind of restructuring we are talking about.

Now, what I want to do is take one of the things that you said and ask Henson and Don both about something that is included in our department which you are specifically saying we shouldn't include. That is EPA.

We put EPA under our department with the idea that the environmental policy of the country is, in fact, something which should be related to good science and so, therefore, you ought to include this and assure that the regulations and so on follow good science, and that inclusion would be the right thing to do.

On the other hand, Dr. Spigai makes a very good point. When you start to combine regulatory policy and other types of policy, you run into some difficulties.

Henson, I wanted your answer because, in fact, the Department of Energy has some of those problems, that it is both a regulatory agency and a policy agency in some senses; and, Don, you obviously do a lot of work in the environmental area. I would like you to also respond as to whether or not this is something which is not the right way to go. Henson?

Mr. MOORE. You will get tremendous support from me, from all of the roles I have filled in life, that regulations ought to be based on sound science, and I think you will hear me be the top of the list saying I don't think that is the case, when I was in government or out.

You have got a real difficult question when you deal with policymaking, scientific research, and regulatory functions, how to break those apart. Most people, and you have seen this debate, have objected to a Department of EPA as long as you had the policymaking and the regulatory function in the same body.

I tend to think it is a lot of—I think the research functions of EPA ought to be in a Department of Science. Its regulatory functions ought not be in that department. I would agree.

The CHAIRMAN. What would you do with those, keep those as an independent agency?

Mr. Moore. I don't have a good idea, a good suggestion. If you are talking about continuing EPA as it is today as a regulatory body and not as a policymaking body and not as a research body, maybe that is the answer.

I have not really studied it. I just think that we found in many cases—I will give you an example. When you get into EMF, electromagnetic fields, we found out that EPA was issuing reports on that back when I was in government and had done no research.

What they were doing was taking research DOE had done or paid to have done and cutting and pasting the parts they liked, and the parts they didn't like fell on the cutting room floor. You came out with a report that said EMF is a horrible thing.

In fact, if you look at the science of that, there was no value added by EPA. There wasn't any science done by that, and that is the danger. That is why I argue and feel from that experience and others that the science ought to be done according to scientific method in a body that is committed to science.

Then from that you determine do you have the basis to make regulations? If the same body does it, you can find slogans really taking precedence over science.

The Chairman. Don, would you comment on that?

Mr. Ritter. Yes. In my testimony I commented that that probably would be a difficult move to—well, it would, one, be a very difficult move to bring the EPA regulatory arm over into a department like this simply because—I think we all know the reason. It is jurisdictional in the extreme. They are also political out in the field, but let me say that the EPA does set policy as well as do regulation. We all know that, and, of course, they do science.

Part of the problem is that the science policy has led and not the science so if a policy is desirable, the science is kind of put together to fit it. That has been too much—not all the time but too much the past history of EPA.

So the trick is to divorce the science function, to the extent you can, from that regulatory function.

The Chairman. But to follow on, just for a moment, we have tended to treat within government the idea of energy and environment as polar opposites when, in fact, I think some of the work that you have done with the Environmental Policy Institute and some of the things that I have seen in developing the science that we have worked with in this Committee for 20 years is that there is a synergism between the two; that, in fact, you can have both good energy policy and good environmental policy if you are talking about the right energies and the right environmental standards; and that with good science you can, in fact, create a synergism between the two.

Wouldn't it be valuable within the structure of the government to deal with the synergism rather than the polar opposites?

Mr. Ritter. I think in a perfect world you could get the science over into the Science Department. You would have to call it something else other than science because you would have two major—particularly EPA as well as DOE. You would have two major regulatory functions.

It is really like one is a fish and one is a fowl. The science gets fouled up—no pun intended—by people looking at regulatory policy, and it is good to keep them apart.

Things change in politics, and maybe institutionally there is some difference between the science function having to do what I talked about earlier. The quality and integrity of science and the legislative and regulatory process, to me that is probably the number one responsibility, because it hasn't been around. We haven't seen it. We have gone through 20 years of megaregulation, and where, you know, where has the Science Committee been? It has been divorced by—on purpose, almost, but the time has come to get science under control, and if we can do that, maybe we can influence the regulation.

If you put them both together, there may be such—I think ideally it would be a good idea. I am not sure you get it done. I mean, think of the committee structure around here that would be diametrically opposed to that, you know, on the Republican side of the aisle.

The CHAIRMAN. I should say I am also serving as part of the Task Force on Reforming and Restructuring the Congress, and one of the ideas that we have on the table right now is to totally eliminate the committee structure of the Congress.

Mr. RITTER. Aha!

The CHAIRMAN. And begin to think in terms of bringing groups together as they are needed on issues where you would have a constantly changing——

Mr. RITTER. I might add that in some of our competitor nations the Science Ministry drives——

The CHAIRMAN. That is going to be hard to do, by the way.

Mr. RITTER. What?

The CHAIRMAN. That will be hard to do.

Mr. RITTER. Hard to do? I think so, yes, but at least there is a glimmer of hope.

In other nations in some of our major competitor nations the science function drives, drives the environmental regulatory function far more than it does here. But, of course, there is politics everywhere.

Mr. BAKER. Will the gentleman yield?

The CHAIRMAN. I will be happy to yield to the gentleman.

Mr. BAKER. I think under Dr. Spigai's proposal the answer is clear. The science goes to the science, and the environmental regulatory function would go under natural resources where—I don't want to use too many pejoratives, but the blue sky EPA people would have to rub shoulders with the farmer or a park manager or some real world people.

I will use, as an example, the Clean Water Act. With EPA's connivance the first line in the Clean Water Act is, we are going to abolish chlorine. Well, after bubonic plague took over and some cooler heads prevailed, we decided maybe chlorine wasn't the number one problem in the world, and they backed off to that, but that certainly wasn't science driven.

So I would like to suggest that we could take the science and put it in the Science Department, take the regulatory functions of really what is our interior, our environment, and put it in with the interior and other people, and it would work fine.

I think that science has to drive the regulatory process and not the other way around, whether it is conservative, free market, Dana Rohrabacher, or whether it is left wing, "We are going to do everything for the environment and everybody starves to death; that is just too bad; it is a byproduct."

Dr. SPIGAI. I agree with you, Mr. Baker, obviously. I would put the regulatory functions either in the natural resources or much of this concerns safety, human safety, environmental safety, and could conceivably go into a safety division with other regulatory safety agencies, into a reconstituted Department of Health, Education, and Social Welfare.

So wherever you put it, don't put it in the Science Department.

The CHAIRMAN. Okay.

Mr. BAKER. Don't put what?

Dr. SPIGAI. Don't put the regulatory function in the Science Department. You could put it someplace else because it diffuses the message.

Mr. BAKER. I agree.

The CHAIRMAN. I thank the gentleman, and I thank the panel very much. As we proceed with this issue, we may come back to you and ask you to respond to some questions in writing along the way.

I hope that you will be willing to do that because you have been very, very helpful today, and I think the diversity of the panel has been very useful for this first hearing.

Thank you for participating. With that, this hearing is adjourned.

[Whereupon, at 11:45 a.m., Wednesday, June 28, 1995, the Committee was adjourned, subject to call of the Chair.]

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